

# IDEAmax 384<sup>®</sup>

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# **IDEAmax 384<sup>®</sup>:**

Combination Card for the  
IBM Personal Computer<sup>®</sup>



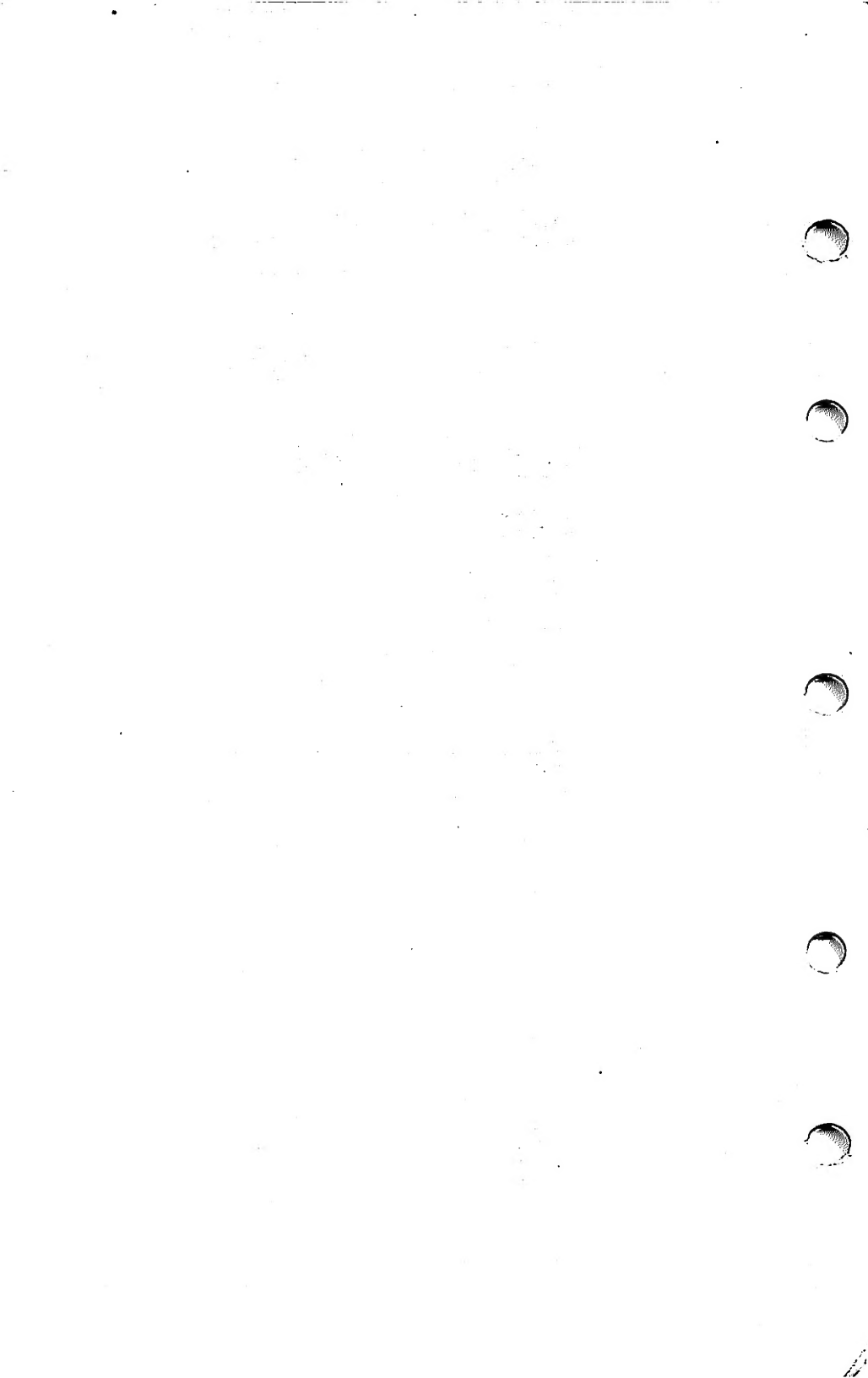
## **Installation and Reference Manual**

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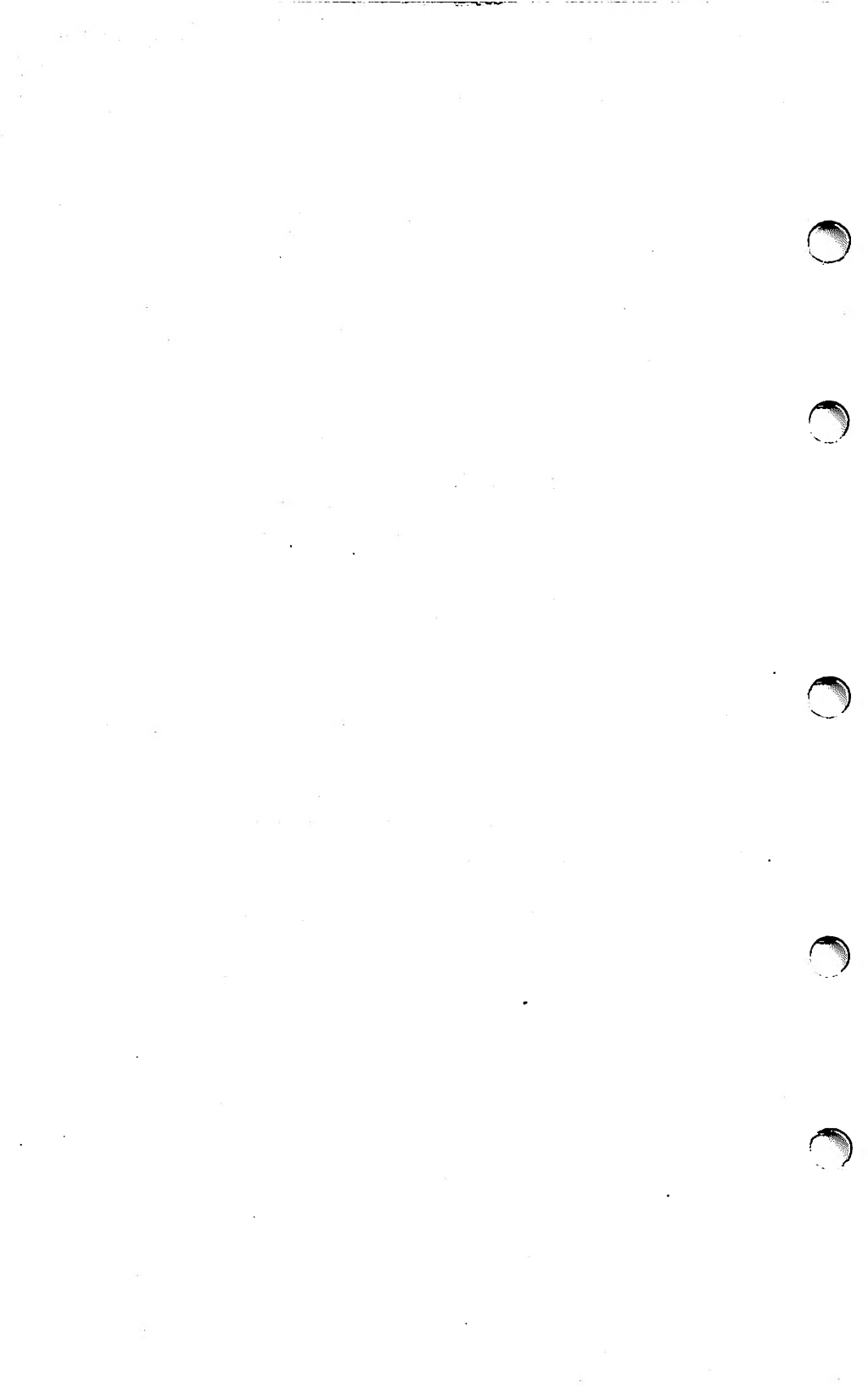
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Product: IDEAmax 384

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# Credits

## Warranty and Support Information



IDEAssociates guarantees all Products for one year. During the one year warranty period, IDEA will repair or replace your Product at no additional charge. If the warranty period expires, IDEA will repair a Product on a time and materials basis. Refer to Appendix J for details of the limited warranty.




IDEAssociates has an established network of computer dealers throughout the United States and Europe. To place an order or to locate the nearest dealer, call nationwide at (800) 257-5027.

IDEAssociates supports the IDEAmix 384 on the IBM PC, XT, AT, and Portable Computers.

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In this manual, DOS refers to PC-DOS, a copyright of International Business Machines.





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# Section I: Introduction



Congratulations on your purchase of the IDEAmix Combination Card for the IBM Personal Computer. This manual gives step-by-step instructions for installing and using your IDEAmix card. IDEAssociates hopes that you find our product totally satisfactory. Should you have any questions, problems or compliments, please call us at (800) 257-5027.

The IDEAmix Combination Card is available for the PC, PC-2, XT, and Portable Computers. Rev. F of the card is available for the AT. The card is available with up to 384K RAM and the following options: parallel printer port, serial (RS232C) port, game port and battery driven clock/calendar. The IDEAmix Card comes with RAMFLOPPY disk emulation, printer spooler, parallel printer selection, and diagnostic software. All this is made conveniently available through IDEAmenu.

IDEA believes in the quality of its products, and guarantees your IDEAmix Combination Card for one year. After the installation is complete, please fill out the warranty card and return it to IDEAssociates.

---

# Getting Started

## The Box

Note the amount of protective material we have placed around the Combination Card. This ensures that you receive an undamaged board.

Please save the inside box and packing material; should you need to return the IDEAmix Combination Card for upgrade or repair, this is the best packaging for safe shipping.

## Inventory Checklist

The following is a list of the components you should have received.

- IDEAmix Combination Card
- Mounting bracket and screws
- Combination Card support guide for the PC & XT
- Diskette with utility and diagnostic programs (IDEAmix)
- Installation and reference manual
- Serial port connector cable (serial port option only)
- Game port connector cable (game port option only)
- Warranty card



---

## The IDEAmix Combination Card

Each bank of nine integrated circuits (see Figure 1-1) on the left hand side of your IDEAmix Combination Card represents 64K bytes of memory. The banks are populated from left to right. Please make sure that the number of columns corresponds to the amount of memory you ordered (for example, 128K bytes would mean the two left columns are populated).

The locations of switch bank 1, switch bank 2, the parallel port, the serial port (RS232C), the serial interrupt jumpers, and removable battery are shown below.

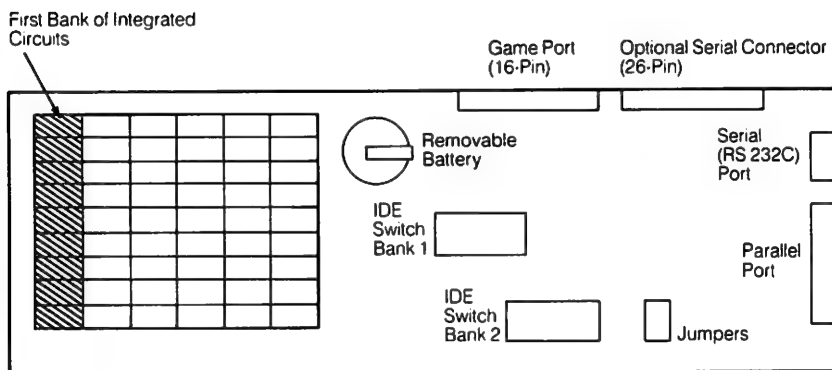


Figure 1-1: IDEAmix Combination Card

If you have not ordered all of the options, there may be empty sockets or spaces on the board to the right of the banks of memory.

---

## Careful!

During the installation process, please be careful with your IDEAmix Combination Card. Dropping the card or spilling coffee on it is not conducive to proper operation.

## Tool Requirements

A medium size flat-blade screwdriver is required. Pliers or a 1/4 inch socket wrench may be required to remove the back cover of certain models of the IBM PC.

## Serial Number

Please turn your IDEAmix Combination Card to the circuit side. The serial number will be in the upper left hand corner. Record this NOW on both your warranty card and on the line provided below.

Serial Number: \_\_\_\_\_

## Diskettes

Be sure you have the IDEAmix diskette, an operating system diskette (preferably a back-up copy of the original provided by IBM) and a blank diskette available. Use the blank diskette to make a back-up copy of your IDEAmix diskette before beginning installation. Instructions on how to copy files are given under "COPY Command, DOS Commands," in the *IBM Disk Operating System Manual*.

---

## Section II: Hardware Installation



The installation of your IDEMax Combination Card is accomplished in four easy steps. Please read all of the instructions before beginning the installation.

1. Opening the IBM
2. Setting switches
3. Inserting the IDEMax Combination Card
4. Replacing the IBM cover and recabling your system

After installing the hardware, please test your new IDEMax Combination Card with the diagnostic software described in Section III.

NOTE: The AT and XT are similar to the PC, so only drawings for the PC are shown on these pages. For details on the AT, see the IBM *Installation and Setup* guide for the AT.

---

# Opening the IBM

## Preliminary Steps

- Turn off the power switch.
- Be sure the AT is unlocked.
- Turn off all peripheral devices (disk drives, printers, monitors).
- Unplug the computer and all peripherals from the wall outlet.
- Carefully note where each cable is connected, then disconnect all cables from the back of the computer.
- For the AT, remove the back panel, if it is attached, by pulling.

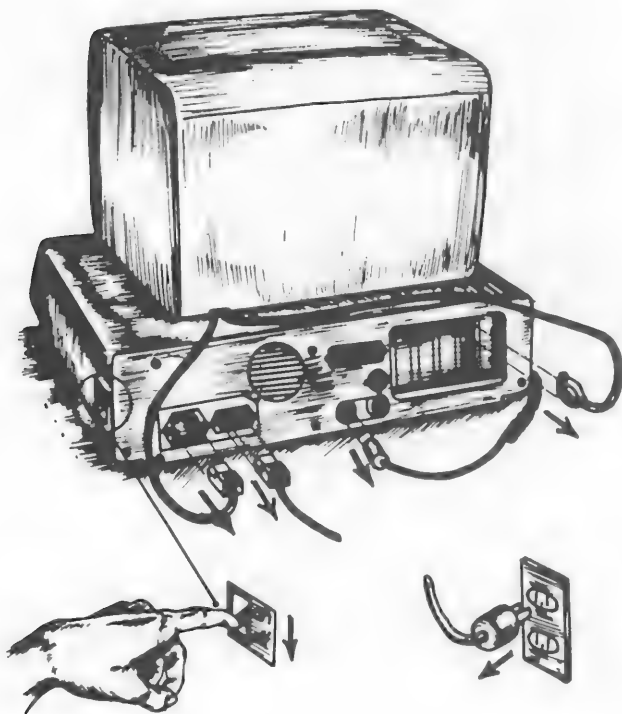


Figure 2-1: Unplugging the IBM

---

## Cover Removal

- Move your keyboard and all external options away from the work area.
- Position the computer to allow rear access.
- With a flat-blade screwdriver, remove the two cover mounting screws shown below by turning the screwdriver counterclockwise (CCW). There are five screws to remove for the AT.
- You may need pliers or 1/4 inch socket wrench to open certain models.

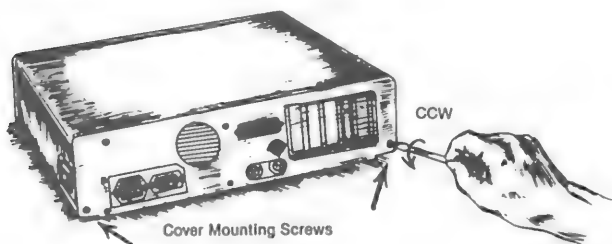


Figure 2-2: Removing the Cover Screws

- 
- Carefully slide the cover away from the rear of the unit as illustrated in Figure 2-3. When the cover will go no farther, tilt it up and remove it from the base. Less tilting is required for the AT.

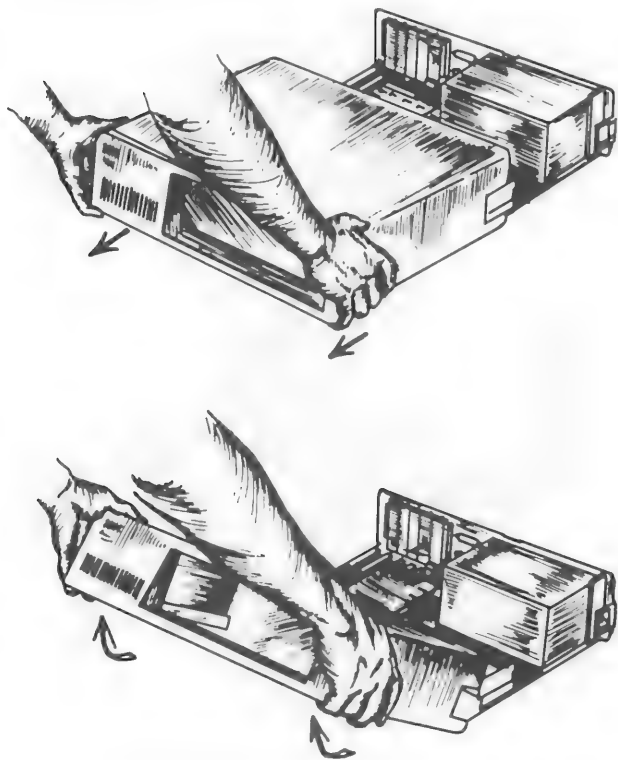


Figure 2-3: Removing the Cover

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## Setting Switches

To install your IDEAmix Combination Card, you must set the switches on the IBM system board and the IDEAmix card. To do this, you must identify the kind of IBM Personal Computer you have, the switch banks in your IBM computer, and the switch banks on the IDEAmix Card. This section provides instructions for setting the memory and other option switches. You need only complete the memory worksheet for your type of IBM Personal Computer, and set the switches for the options you selected.

There are no switches to set on the AT system board in order to use the IDEAmix card. However, if memory exceeds 512K, you must change a jumper on the system board. You must also run the IBM Setup program. Therefore, AT users should also complete a worksheet.

There are generally two types of switches in use: rocker switches and sliding switches. Please familiarize yourself with the type of switch that is used in your system before proceeding.

---

## Switch Identification

### IBM PC Switch Identification

The IBM PC and the IBM PC-2 each contain two banks of switches as shown Figure 2-4. Looking from the front of the computer, switch bank 1 is to the left and switch bank 2 is to the right. The first switch on either bank is the one closest to the rear of the computer and the eighth switch is closest to the front of the computer. Switch bank 1 indicates the amount of system board memory. Switch bank 2 indicates the total amount of memory installed in the system.

To determine whether you have an IBM PC or IBM PC-2, look from the front of the system unit at the left hand edge of the system board. If it is labeled 16KB-64KB, you have a PC; if it is labeled 64KB-256KB, you have a PC-2.



## IBM XT Switch Identification

The IBM XT has one switch bank situated in the same location as switch bank 1 on the IBM PC. The first switch is closest to the rear of the computer.

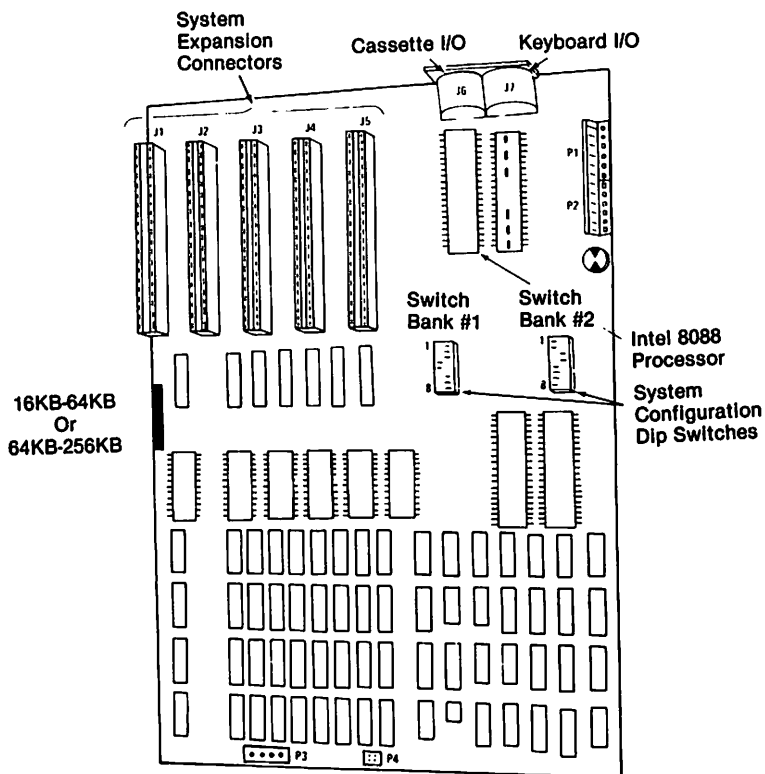


Figure 2-4: IBM PC System Board (Top View)

In pencil, record the current switch settings of your IBM Personal Computer below. This will be useful for future reference should you have to retrace the steps of the installation procedure.

IBM-PC  
or XT  
Switch  
Bank 1

on

1

2

3

4

5

6

7

8

↑

IBM-PC  
Switch  
Bank 2

on

1

2

3

4

5

6

7

8

↑

Figure 2-5: Original Switch Settings

---

## IDEAmax Combination Card Switch Bank Identification

There are two switch banks on the IDEAmax Card (Figure 1-1). Figure 2-6 shows the switches that control each combination card function. The two switch banks on the IDEAmax Combination Card should arrive set to the configuration shown.

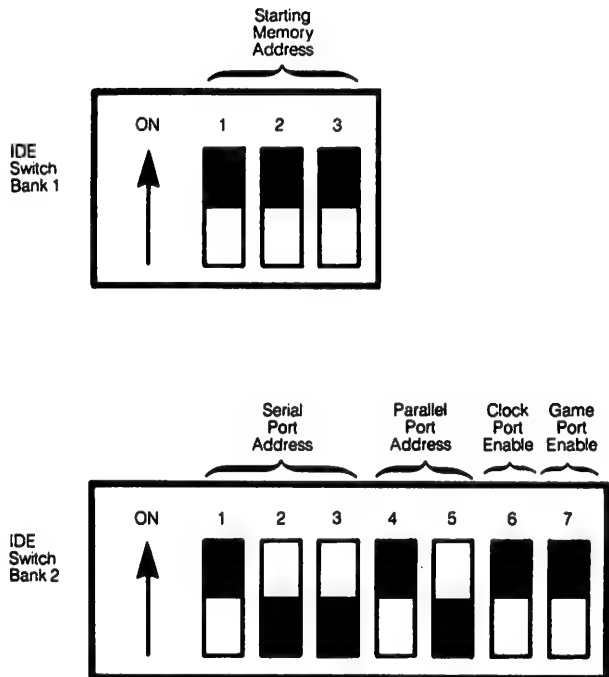


Figure 2-6: Factory Setting of IDEAmax Switches

# Memory Switches

## Worksheet for Setting Memory Switches on the IBM PC

To install the memory on your IDEAmx card you will need to know the starting address for the IDEA memory and the total amount of memory in your system. Switch bank 1 on the IDEAmx card determines the starting address of the IDEA optional memory. Switch bank 2 on the IBM PC system board tells the machine how much total memory is in the system.

- 1. The IDEAmx option memory must physically follow the system memory and any other option memory in your system. To find out how much memory you have (before installing the IDEAmx card) look at switch bank 2 on the IBM PC system board. Compare the switch settings with the chart below.

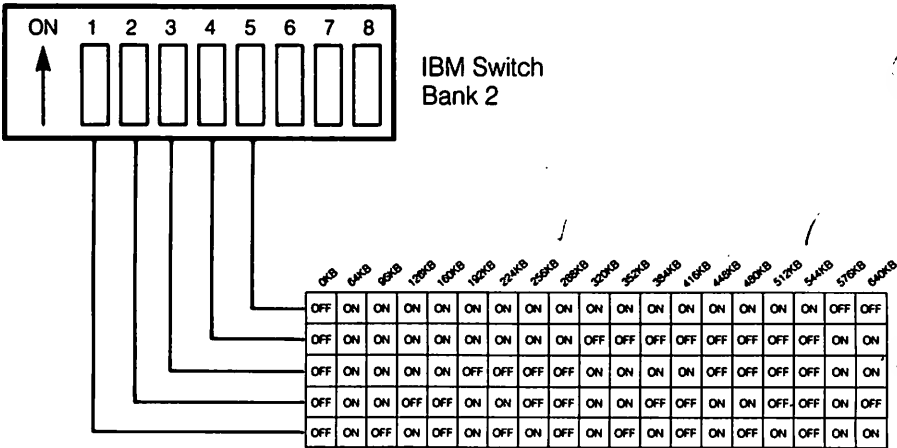


Figure 2-7: Total Original Memory in System  
IBM Switch Bank 1

- 
2. Enter the total amount of original system memory in the box.

Total Amount of Original System Memory

If this amount is not divisible by 64, please see Appendix B before proceeding.

3. If you have a PC, check IBM switch bank 1 to be sure that you have 64K bytes of total system memory. You must have at least 64K bytes of memory before you can install the IDEA optional memory. You may get additional memory for your system board from your local retailer or IDEAssociates.

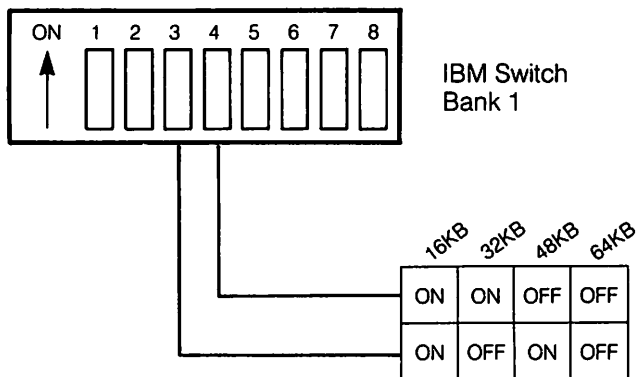
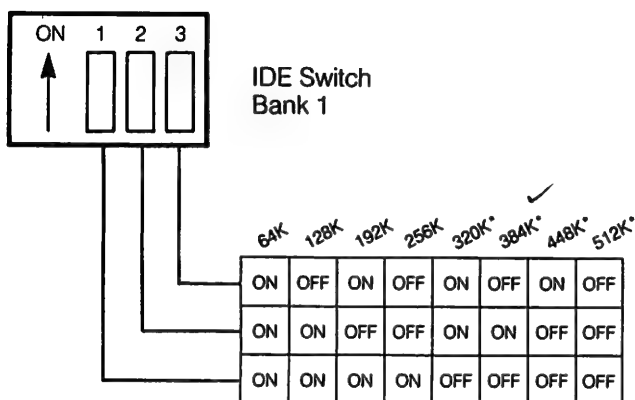


Figure 2-8: Memory on the System Board  
IBM Switch Bank 2

If you have a PC-2, and IBM switch bank 2 shows less than 256K total system memory, you must add more system memory before you can install any optional memory. Additional memory may be purchased from your local retailer or IDEAssociates.

4. The starting address of the IDEAmx memory is the same as the total original system memory. Set the IDEA switch bank 1 to the same address as the total system memory determined in Step 1.



\*These starting addresses cause IDEA memory to be mapped in a special fashion. Please see Appendix C.

Figure 2-9: Starting Memory Address

5. You also need to know how much memory you are adding to your system. Enter the amount of optional memory you selected on your card (64K, 128K, 192K, or 256K) in the box.

Amount of optional memory on IDEAmx Card

324  
256  
—  
640

6. Add the amount of IDEA memory and the starting address of the IDEA memory to get your new total system memory amount. Enter this amount in the box. Look at the chart in Figure 2-10, and set switch bank 2 on the IBM system board for this amount.

Starting Address of IDEA Memory + Amount of IDEA Memory (New Total Amount of System Memory)

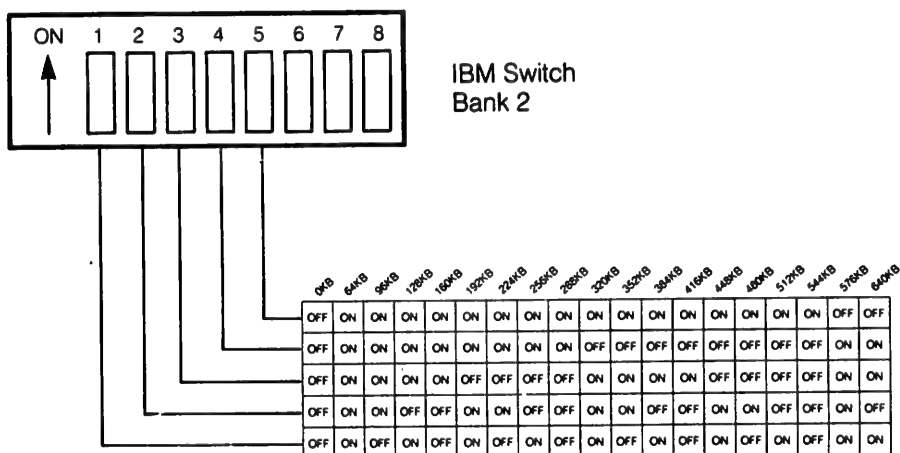


Figure 2-10: New Total Memory in System

7. If you wish to add more than 384KB memory by installing a second IDEAmix Combination Card, the first card must be filled to the 384KB capacity before adding the memory on the second card.

**Worksheet for Setting Memory Switches  
on the IBM XT**

To install your IDEAmx memory, you must set its starting address on IDEA switch bank 1.

- 1. The IDEAmx memory must follow the memory already in the system. The IBM XT dynamically determines optional memory in the system, unlike the IBM PC, which uses a switch bank to set the total system memory. You can determine the total system memory of your XT in the following ways:
- If you have no optional memory in your system, the total amount of system memory must all be on the system board. Compare the setting of IBM switch bank 1 with the chart below to find the amount.

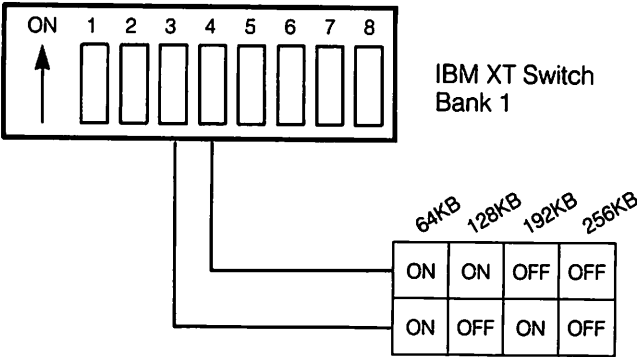
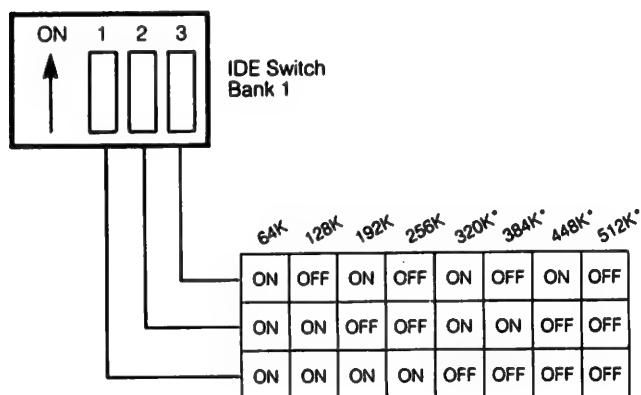


Figure 2-11: Memory on the XT System Board



- Count the memory banks on any optional boards in your system. Each bank of eight or nine chips usually contains 64K of memory.
  - When the XT powers up, it checks all the memory in the system, and flashes the amount on the screen. The amount should agree with your calculation.
2. Enter the total amount of system memory in the box.

3. The starting address of the IDEAmx memory is the same as the total system memory. Set the IDEA switch bank 1 so that the IDEAmx memory has a starting address corresponding to the total system memory.



\*These starting addresses cause IDEA memory to be mapped in a special fashion. Please see Appendix C.

Figure 2-12: Starting Memory Address on the XT

**Worksheet for the IBM AT**

There is a jumper on the AT system board that indicates to the AT where to look for additional memory — on the system board or on an adapter board. When you purchase the AT, its system board is normally set for a memory of 512K. If the AT already has 512K of memory, you are adding memory between the addresses of 512K and 640K, and do not need to move the jumper. If your system has 256K of memory, you are adding memory between the addresses of 256K and 640K, so you must set the jumper to disable the second half of memory on the AT system board, thus making the system use the memory on the Ideamax card.

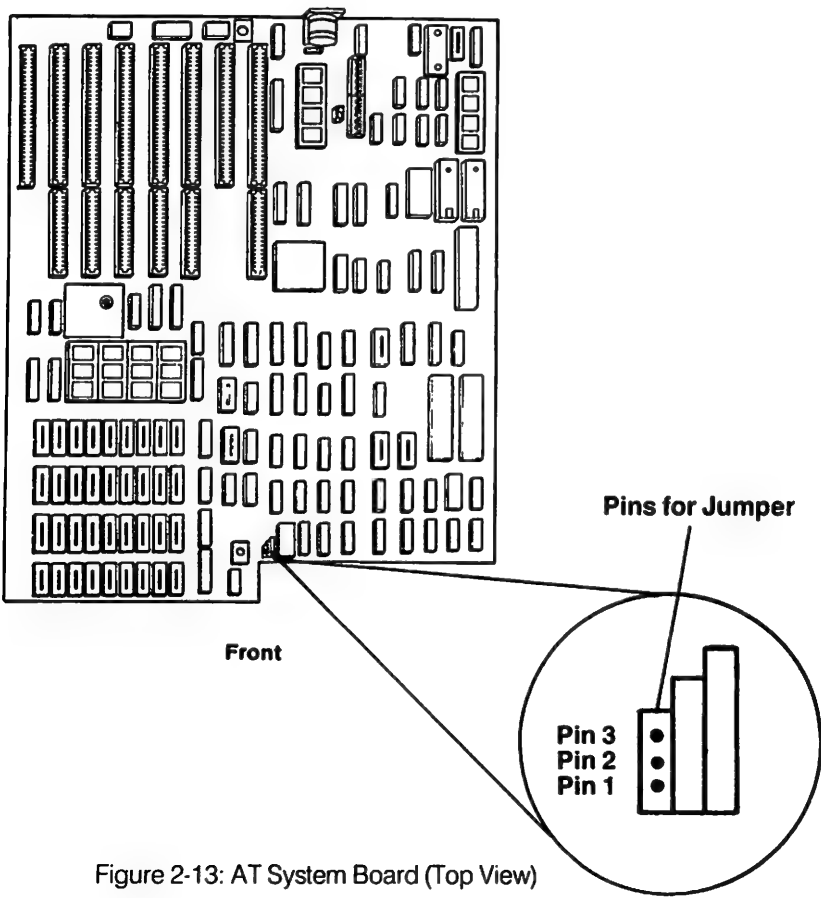


Figure 2-13: AT System Board (Top View)

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If Pins 1 and 2 are connected (jumped), the second bank of 256K memory is enabled. If Pins 2 and 3 are connected, the second bank is disabled. Moving the jumper usually requires removing the AT controller board, which almost covers the pins.

You must be sure the jumper connects Pins 2 and 3. Then at setup time you must tell the AT that it has the extra memory. (Setup is discussed in Section III.)

If your AT already has 512K of memory, leave the jumper connecting Pins 1 and 2. Otherwise, move the jumper to connect Pins 2 and 3.

1. Enter here the amount of memory sold with your AT:

2. Enter here any memory that you have already added with options other than the IDEMax card:

3. Add up the two preceding boxes to get the total system memory, which is the starting address for the IDEMax card:

4. Add to #3 the amount of memory purchased on your IDEMax card. This is Total System Memory for Setup program:

NOTE: The address of the IDEMax card cannot exceed 640K.

4. The starting address of the IDEAmx memory is the same as the total system memory. Set the IDE switch bank 1 so that the IDEAmx memory has a starting address corresponding to the total system memory in the preceding box.

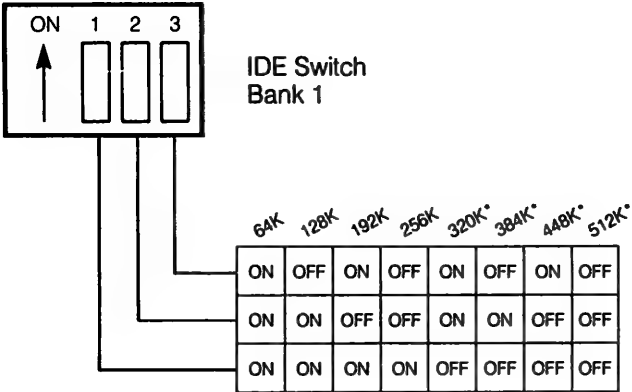


Figure 2-14: Starting Memory Address on the AT

5. To the number in the preceding box, add the amount of memory on your IDEAmx card. This is the total base memory that you will give the Setup program discussed in Section III.

Total New Base Memory

## Option Switches

IDEA switch bank 2 configures your combination card for the options you selected. The sections on parallel, serial, clock and game ports all refer to Figure 2-15.

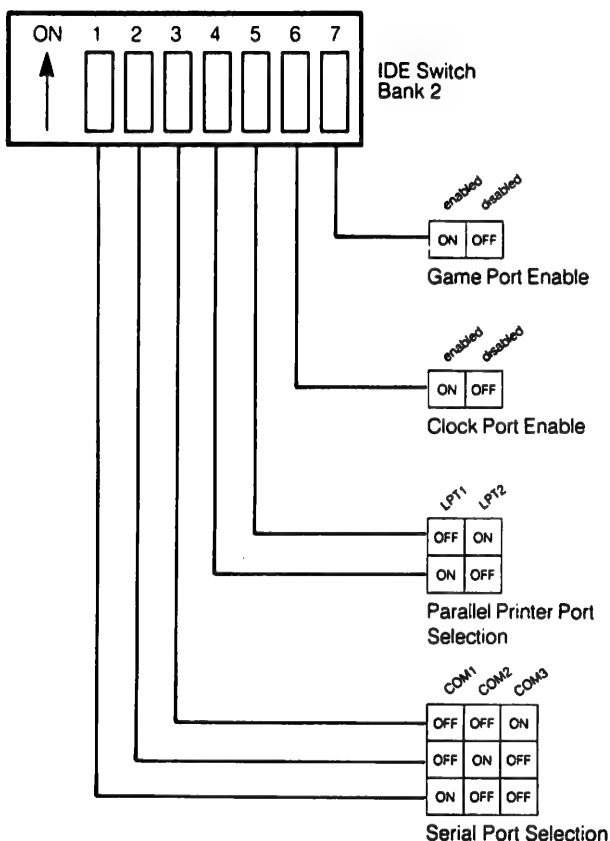


Figure 2-15: Option Switches on the IDEAmx Card

---

### Parallel Port Switches

The IDEAmix parallel port may be used as LPT1 (printer 1) or LPT2 (printer 2). The IDEA parallel printer port should be set as LPT1 unless there is another parallel printer port (other than the monochrome parallel printer adapter) already set as LPT1. In this case the IDEAmix parallel printer port should be set as LPT2. (See Appendix D for more detailed information.)

If you have more than one parallel printer, the IDEAmenu (on the IDEAmix diskette) is used to designate the printer. It is documented in Section IV.

### Serial Port Switches and Jumpers

The IDEAmix serial port may be used as COM1 or COM2. If you have no other serial port, IDEA recommends that you use the serial port as COM1. You must adjust switch bank 2 and the serial interrupt jumpers on the IDEAmix card.

For users needing three serial ports, IDEA has defined a third serial port address, COM3. See Appendix G for details on the use of this port.

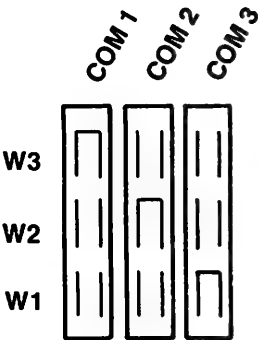


Figure 2-16: IDEA Serial Interrupt Jumpers  
(Detail of Figure 1-1)

---

The IBM PC sets up the serial interface for standard operation. Should you need to change the setup of the Asynchronous Communications Controller, please see "Asynchronous Communications Adapter," in the IBM *Technical Reference*.

### **Clock Port Switch**

Switch 6 on the IDEAMax switch bank 2 enables the IDEAMax real time clock.

### **Game Port Switch**

If you have the IDEA game port option, you should make sure that switch 7 on IDEA switch bank 2 is in the correct position. See Figure 2-15.

---

# Inserting the IDEMax Card

## Slot Cover Removal

- Once the PC or XT and IDEMax Combination Card switches have been set, or the jumpers adjusted for the AT, you can insert the combination card into your IBM.
- There are five system expansion slots towards the rear of your system unit. You can install your IDEMax Combination Card in any one of the five slots, although we recommend using slot 3 if available. (Count from the power source, to the left if you are behind the IBM.)
- Use a flat-blade screwdriver and remove the screw that holds the system expansion slot cover in place by turning it counterclockwise (CCW).
- The screw must be saved for installation of the IDEMax Combination Card.

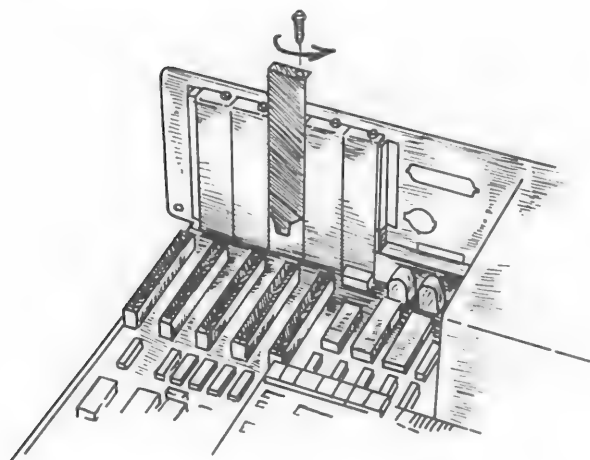


Figure 2-17: Removing the Slot Cover



---

## Support Guide

- The support guide is enclosed in your IDEA product package. Press the IDEAmix support guide into the corresponding holes in the front panel of the computer. (No support guide is needed for the AT.)

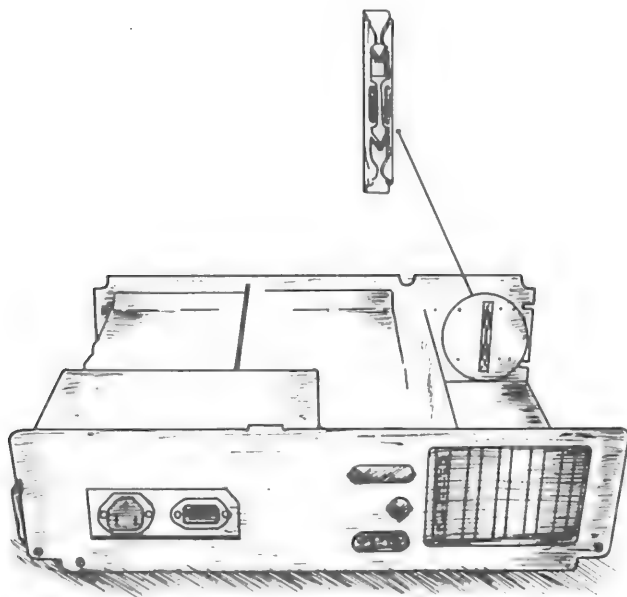


Figure 2-18: Adding the Support Guide

---

## IDEAmax Combination Card Insertion

### Optional Game Port Connection

The game port is attached by a 16-pin connector at the top of the IDEAmax Combination Card. Attach it as follows:

- Pass the 16-pin straight connection through the slot for the IDEAmax Combination Card.
- Align the red dots on the Combination Card with the connector and plug in the connector.
- Fold the cable so that it lies flat against the board.
- Align the cable so that it passes through the cutout on the side of the combination card bracket. See Figure 2-19.

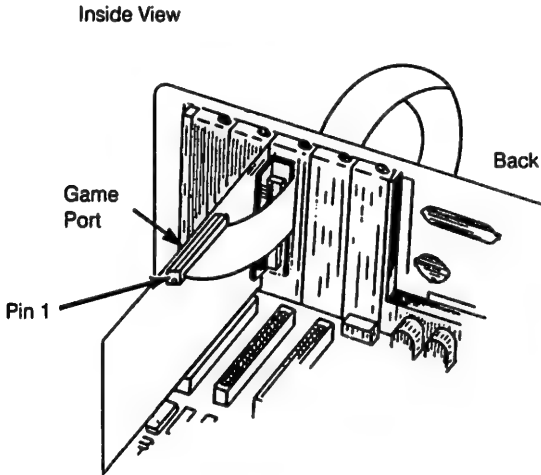


Figure 2-19: Connecting the Game Port

---

## Inserting the Card

- Hold the combination card by the top. Slide it down through the support guide, and firmly press it into the expansion slot you have selected. Be sure that the card is sliding in the support guide if you have a PC or XT.

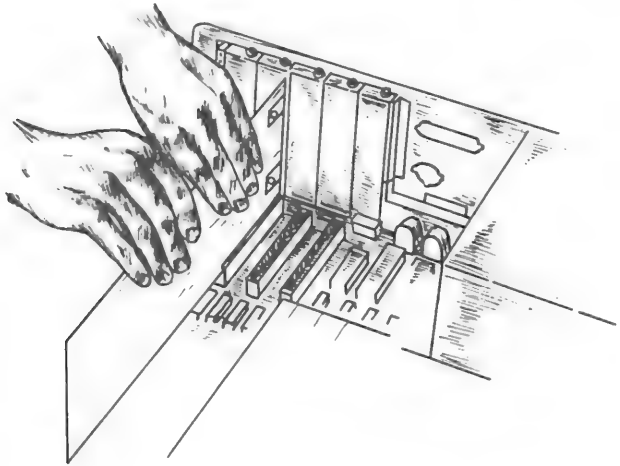


Figure 2-20: Inserting the IDEAmax Card

---

## IDEAmax Combination Card Alignment

- Align the hole in the IDEAmax Combination Card retaining bracket with the hole in the rear panel of the computer. Turn the screw clockwise (CW).

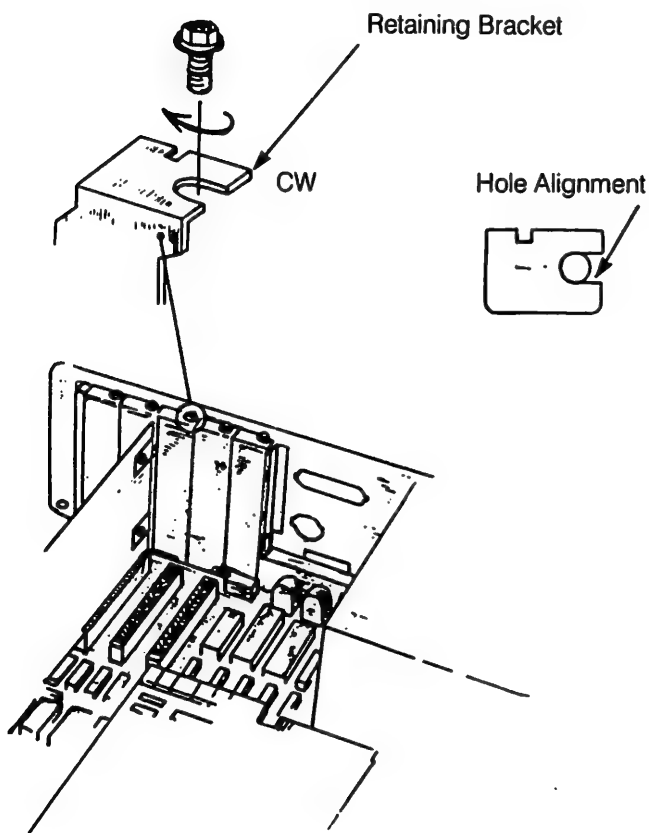


Figure 2-21: Aligning the Card

---

# Replacing the IBM Cover and Recabling Your System

## Replacing the IBM Cover

- If you have any other options to install, do so now before replacing the cover.
- Replace the cover by positioning it as shown and carefully sliding it toward the rear of the computer.

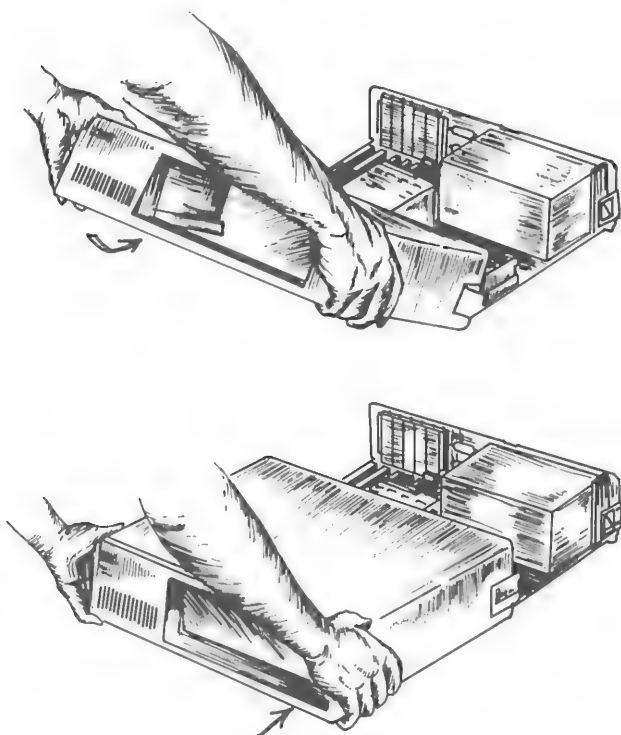


Figure 2-22: Replacing the Cover

---

## Replacing the Cover Screws

- When the cover is all the way to the rear, align the screws with the threaded tabs and tighten. Use a flat-blade screwdriver and turn clockwise (CW).

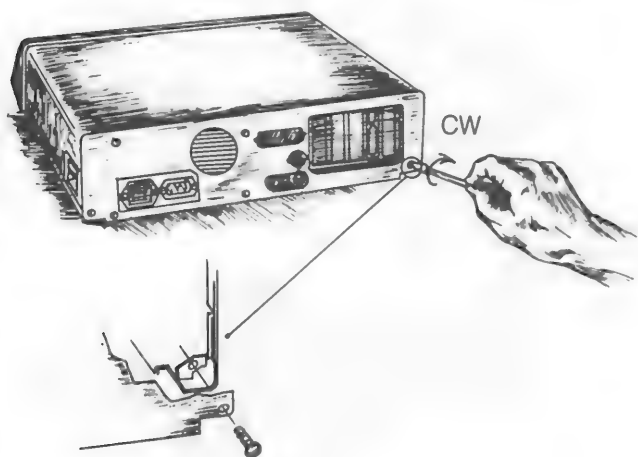


Figure 2-23: Tightening the Cover Screws

- Your system is now ready to be recabled and tested.

---

## Recabling Your System

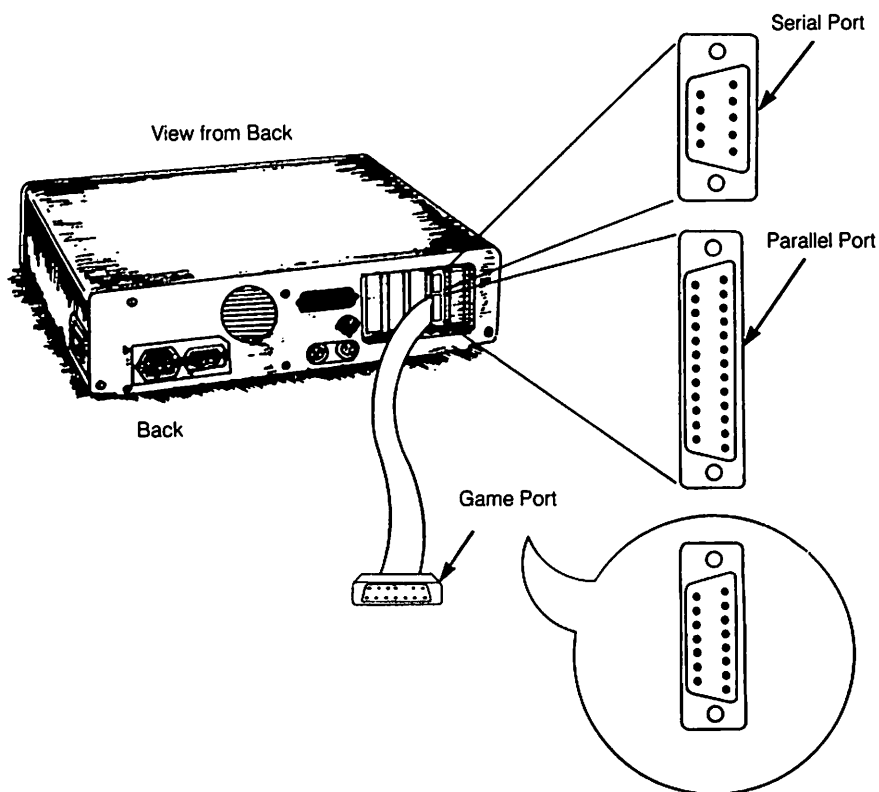


Figure 2-24: Recabling the System

### Parallel Printer Connection

The parallel printer 25-pin connector is mounted on the card. When the card is properly installed, the connector extends out through the retaining bracket.

### Serial Port Connection

The serial port 9-pin connector is mounted on the IDEAmix Combination Card above the parallel port. When properly installed, the connector extends through the retaining bracket as shown in Figure 2-24.

---

To mount your serial port peripheral, attach the 9-pin connector on the IDEA supplied cable to the 9-pin connector on your IDEAmix Combination Card. Next, plug the 25-pin connector from the peripheral into the 25-pin connector on the cable. Your peripheral is now installed.

Please refer to your notes on "Setup" in the *IBM Guide to Operations* for information on recabling the other elements of your system.



---

# Section III:

## Diagnostics and Troubleshooting

### The IBM Powerup Memory Test

Once you have installed your IDEAmix 384 card and have your IBM reassembled, insert your operating system diskette into Drive A, and turn the power switch ON.

On powering up, the IBM automatically tests installed memory. On the AT, the screen will display '164 Memory Size Error.' Run the IBM Setup Program described in this section and reboot. If your screen still displays this error message, you may have entered incorrect information in answer to the Setup program's query for amount of Basic and Extended Memory. Rerun the Setup program and recheck the information you supplied.

If, during powerup on the PC, an error message appears on the screen, please turn to the error messages at the end of this section (Problems Not Related to Option Memory).

If no error message appears, the IBM Powerup Memory Test has successfully concluded. On the PC, you are now ready to run the IDEA Memory Test Program. On the AT, run Setup and then the IDEA Memory Test Program again.

---

# The IDEA Memory Test

The Memory test performs various functions depending upon your system model. It reads the total system memory and examines whether a memory chip is functioning properly or not, displaying the output in a **memory map**, a visual representation of your IDEAmemory card. If you have an IBM PC, the Memory Test also reads and displays switch banks 1 and 2.

## Preliminary Steps

1. Before executing the Memory Test, make a backup copy of the IDEAmemory distribution diskette, using the DISKCOPY command. Keep the original IDEAmemory diskette in a safe place and use the backup copy. Refer to your DOS manual for an explanation of the DISKCOPY command.
2. You can copy the IDEAmemory onto a diskette that has the DOS operating system, making it a **bootable** diskette, capable of starting your computer. To do this, use the DOS command COPY. If all the files do not fit onto one diskette, copy only the files needed for your system. (For example, files ending in .NOT are help files.)

Label this diskette "boot". Refer to your DOS manual for an explanation of the COPY command. Otherwise, work with two separate diskettes — one with the DOS operating system, the other containing IDEAmemory. For the rest of this section, this manual assumes that you have made your IDEAmemory diskette bootable.

There are two ways to run the Memory Test:

1. Execute the Memory Test from the command line.
2. Execute the Memory Test from IDEAmemory.

It is better to use the command line, as this is the only way to test all added memory. In either case, the software first checks whether it is running on a PC, XT, or AT, and tests accordingly. It invokes PCMEM.EXE to test for the PC, Portable and XT, and ATMEM.EXE for the AT.

This section tells you how to run the Memory Test from the command line.

---

# Memory Test for IBM PC and XT

Insert the IDEAmix Diskette into the default drive and type:

---

## IDEMTD

NOTE: you may cancel IDEMTD at any time by pressing the CTRL and BREAK keys together. If you executed IDEMTD from the command line, you return to DOS. If you executed IDEMTD from IDEAmix's Diagnostics Menu, you return to IDEAmix. Also, pressing (Shift-PrtSc) together prints the screen display, a useful action when locating a memory gap, which is explained further in this section.

The IDEA Memory Test examines switch banks 1 and 2 on the PC's system board. Switch bank 1 represents the amount of system memory installed on the IBM PC system board, which must be set to 64K. If not, the following message appears:

---

**XXXXBYTES OF SYSTEM MEMORY CONFIGURED BY  
SWITCH BANK 1. THERE MUST BE 64KBYES OF  
SYSTEM MEMORY BEFORE OPTIONAL MEMORY CAN  
BE USED.**

The double Xs represent the amount of system memory indicated by the switch settings in switch bank 1. If you do not have 64K, set switch bank 1 correctly (refer to Section II) or install more memory.

If switch bank 1 is set correctly and you have a PC, a screen similar to the following appears:

MEMORY DIAGNOSTIC - VER X.XX  
 COPYRIGHT IDEAssociates, Inc. 198x

P	D0	D1	D2	D3	D4	D5	D6	D7
0-64	G	G	G	G	G	G	G	G
64-128	G	G	G	G	G	G	G	G
128-192	G	G	G	G	G	G	G	G
192-256	G	G	G	G	G	G	G	G
256-320	G	G	G	G	G	G	G	G
320-384	G	G	G	G	G	G	G	G
384-448	G	G	G	G	G	G	G	G
448-512	G	G	G	G	G	G	G	G
512-576	X	X	X	X	X	X	X	X
576-640	X	X	X	X	X	X	X	X

#### PC SWITCH SETTINGS:

SWITCH BANKS	*MEMORY
BANK1	*64K
BANK2 (TOTAL)	*512K

DO YOU WANT TO RUN THE READ/WRITE MEMORY TEST  
 (Y/N)?

Figure 3-1: Memory Map of the PC

The left-hand side of the screen displays the amount of installed memory via a memory map. At the top, a line from left to right identifies each memory chip and the numbers on the left-hand side indicate the amount of memory (one bank) installed in each row. (Each row across represents one bank.) The letter G indicates a functioning bank of 64K memory chips. The last bank lettered G is the total amount of system memory. The letter X signals a non-functioning or non-installed bank of 64K memory chips.

For a PC, the right-hand side of the screen displays the amount of memory indicated by the switch settings. Switch bank 1 is always set at 64K and switch bank 2 represents the total amount of system memory.

---

The right-hand side of Figure 3-1 illustrates that the system memory, represented by switch bank 1, and the installed memory, represented by switch bank 2, total 512K. Switch bank 2 should indicate the total system memory, which should correspond to the bank containing the last lettered G on the memory map.

The two sides of the display should be equal. If not, switch bank 2 is not set properly or there is memory that is not installed or not functioning. If switch bank 2 is set correctly, continue the Memory Test. Otherwise, correct the switch setting and proceed with the test.

For an XT or Portable, only the left-hand side of Figure 3-1 appears, because the XT and Portable Computers do not have switches that correspond to total system memory.

## Possible Problems

Regardless of which system option you chose, the memory map may display the letter X between memory locations lettered G if you have not set the switches properly on the IDEAmx card. This can also occur when a chip is disabled. When this situation occurs, the following message appears:

**WARNING: NON-CONTIGUOUS MEMORY  
PLEASE CHECK IDEA CARD SWITCH SETTINGS  
OR CONTINUE WITH TEST USING STARTING ADDRESS  
XXXX**

If you decide to continue the test after this message, select N at the following prompt:

**DO YOU WANT TO TEST ALL OF MEMORY?**

Enter the starting address displayed above in the prompt:

**ENTER RANGE OF 64K**

Go to the top of the next page.

## The Read/Write Memory Test

The Read/Write Memory Test is part of the IDEAS Memory Test Program. This test will check memory greater than 544K bytes and perform other tests not included in the IBM PC start-up routine. After the test described above, a prompt will appear at the bottom of the screen:

**DO YOU WANT TO RUN THE READ/WRITE MEMORY TEST(Y/N)?**

Answer N here to exit the test. Answer Y to get the next prompt:

**DO YOU WANT TO TEST ALL OF MEMORY(Y/N)?**

If the previous test indicated problem chips, you will also have a message suggesting that you test using starting address XXXX, so you should answer N to this prompt. If there were no memory problems this far, answer Y to test all of memory, starting at the first available 64K byte boundary after PCMEM (the memory test itself). Answering N invokes a prompt to enter any three-digit address:

---

**START ADDRESS (EXPRESSED IN DECIMAL K BYTES  
(3 CHARACTERS) = )**

**TEST RANGE EXPRESSED IN DECIMAL KBYTES  
(3 CHARACTERS) = )**

The first prompt requests the starting address of the memory you wish to test. Enter an address between 64K and 640K. It must be a multiple of 64K.

For the second prompt, enter the range of memory to test, that is, the number of banks you wish to test times 64.

The Read/Write Memory Test performs 21 different tests. Each test number display overwrites the completion of a previous test number display. When all 21 tests are completed, the following message appears:

---

**TESTING COMPLETE PLEASE KEY 'ENTER'  
TO EXIT THIS TEST**

The memory map of the card (Figure 3-1) always appears while the Read/Write Memory Test executes. When bad bits are found, a blinking B appears in the bank of the disabled or Bad memory chip. Replace these chips with new ones and execute the Memory Test again to assure that the chips are functioning correctly.

If a problem occurs after you have run the Read/Write Memory Test, restart the IBM PC and reload your operating system.

## How to Identify Which Chips Are Bad

The memory map on the screen corresponds to your IDEAmix Card in the following way:

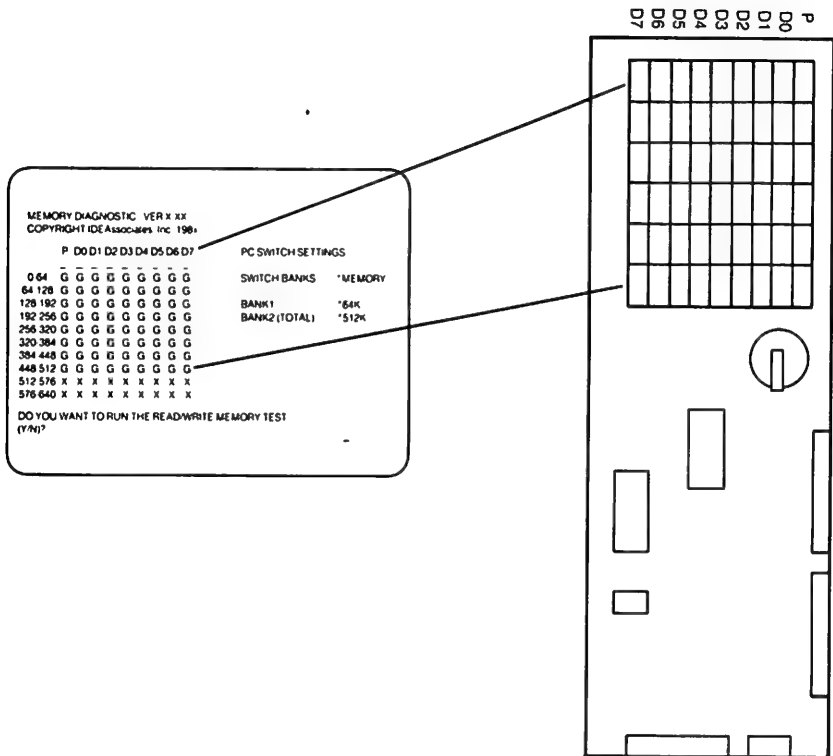


Figure 3-2: General Address Correspondence on the PC

The rows across on the screen correspond to banks on the card. The columns going down on the screen correspond to chips within a bank.

However, there is one adjustment to make. You must figure the starting address in memory of your IDEAmix card and count forward from there on the screen to arrive at the proper bank. (You entered the starting address of your IDEAmix card in Section II.)



For example, if your card starts at 128K, and row 256 has the blinking B, this is the third bank from your start address. So look in bank 3 on your card. If the B is in row D0, find the corresponding row on your card (the rows D0 through D7 are printed on the card.)

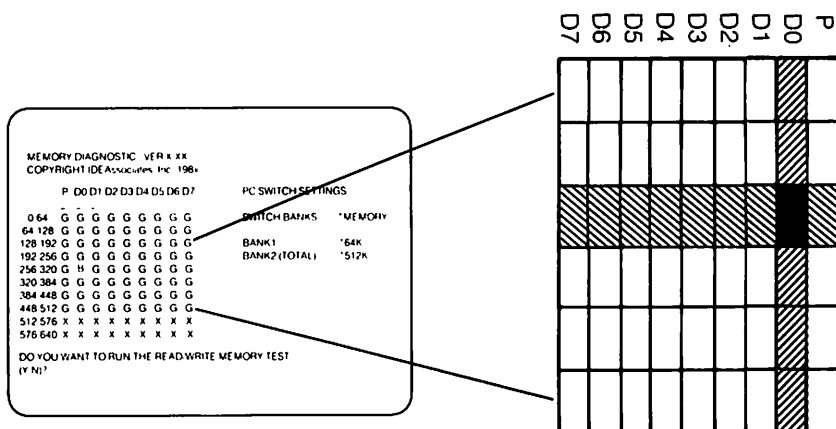


Figure 3-3: Adjusted Address Correspondence  
on the PC  
(For Card Starting at 128K)

---

# Memory Test for the AT

Please note that you must have Rev. F or higher of the IDEAmix card for the AT.

Run the IBM Powerup memory test by turning on the system, as described on page 1 of this section.

## Running Setup

You must now run the IBM Setup Program. If you do not run this program next, the IBM AT will not use the additional memory that has been installed.

To run the Setup Program, install the IBM Diagnostic Test diskette into the system's drive. Move through the Setup Program until the following message is displayed:

---

### **BASE MEMORY IS COMPOSED OF:**

The base memory is the amount of memory originally purchased with your IBM AT plus any options added plus the added memory purchased on IDEAmix. This number is the same one you placed in the last box in Section II (page 2-18). The maximum amount you can enter in answer to the Base Memory query is 640K.

---

Continue through the Setup Program. The next message displayed is:

---

#### **EXPANSION MEMORY IS?**

If the IDEAmx card is the only option installed, the answer to this query will be 0. If the amount of total memory in your system is larger than 640K, you must calculate the remaining memory in your system. In order to do this, subtract 640K from the total memory. The difference is the number you enter in answer to the Expansion Memory query. Continue to the end of the Setup Program.

If your screen displays a 201 error code, there is a data or parity error. A code of 202 or 203 means that there is an address error. Recheck the memory switch settings on the IDEAmx card to be sure that you set the switches for the correct memory address. If the error message begins with 03 or a lower number, the problem is in the original 256K of memory in the IBM AT. (For an original 512K, memory messages start with 07.) Refer to "Testing Your IBM" in the *AT Guide to Operations*.

---

## IDEA Memory Test Diagnostics

The IDEA Memory Test Diagnostics for the AT use a 64K buffer to allow for writing and reading large amounts of memory. Therefore, if this test is run from the command line, there must be at least 128K of good memory in the system. If the program is run from IDEAMenu, at least 256K of good memory is required. For this reason, it is recommended that the test be run from the command line, thus using less memory.

Whenever you run the IDEA Memory Test Diagnostics (IDEMTD), you must use the original IBM AT DOS diskette (do not use an enhanced version that you have changed by adding cache buffers, etc.). This ensures that all memory, except DOS, is tested by IDEMTD.

IDEMTD reads the system memory and examines the memory chips to determine if they are functioning properly. A memory map is displayed which provides a visual representation of your Combination Card.

1. Insert the IDEAMenu disk into the IBM AT drive.
2. Type IDEMTD to execute the memory test.

A screen similar to the one in Figure 3-4 is created as the program is run.

AT EXTENDED MEMORY DIAGNOSTIC VER x.x  
 COPYRIGHT (c) ( ) 198x IDEAssociates, Inc.

128K BLOCKS WITHIN MEG:

	0	1	2	3	4	5	6	7
M 00	G	G	G	G	G	RESERVED		
E 01	X	X	X	X	X	X	X	X
G 02	X	X	X	X	X	X	X	X
S 03	X	X	X	X	X	X	X	X
04	X	X	X	X	X	X	X	X
05	X	X	X	X	X	X	X	X
06	X	X	X	X	X	X	X	X
07	X	X	X	X	X	X	X	X
08	X	X	X	X	X	X	X	X
09	X	X	X	X	X	X	X	X
10	X	X	X	X	X	X	X	X
11	X	X	X	X	X	X	X	X
12	X	X	X	X	X	X	X	X
13	X	X	X	X	X	X	X	X
14	X	X	X	X	X	X	X	X

CMOS MEMORY  
 CONFIGURATION:

SYSTEM 640K  
 EXTENDED 0K

DO YOU WANT TO TEST A RANGE (R) OF MEMORY, OR EXIT  
 (ANY OTHER KEY)?

Figure 3-4: Memory Map of the AT

The map finds and displays 128K functional memory blocks within each megabyte of memory. The columns down show within which megabyte of memory a chip is located. The megabytes are indicated by the leftmost column of numbers. The rows across down show 128K blocks within each megabyte, corresponding to the numbers 0 through 7. A "G" is displayed for functional memory and an "X" is displayed for nonexistent or nonfunctional blocks (chips).

If the map displays an X between blocks displaying G's an error message is displayed which reads "Warning - non contiguous memory." Refer to the section on error messages below.

---

If your switch settings are all right, continue the test by using the "R" (range) feature explained below.

At the bottom of the display is a query:

**DO YOU WANT TO TEST A RANGE (R) OF MEMORY, OR  
EXIT (ANY OTHER KEY)?**

To continue the test, enter R, then in answer to the next query enter the starting row and column and ending row and column you want tested. When typing the row and column references, do not use spaces between row and column designations. Make sure that you use a comma between the row and column specified. For example, to test 640K of memory:

**PLEASE ENTER STARTING ROW AND COLUMN  
(ROW,COL): 00,1**

**PLEASE ENTER ENDING ROW AND COLUMN  
(ROW,COL): 00,4**

Once the row and column parameters have been entered, the display changes to the screen shown in Figure 3-5.

---

AT EXTENDED MEMORY DIAGNOSTIC VER x.x  
COPYRIGHT (c) 1985 IDEAssociates, Inc.

MEMORY ADDRESS IN KILOBYTES	DATA AND D0 — D7P	PARITY BITS D8 - D15P
128-256	GGGGGGGG	GGGGGGGG
256-384	GGGGGGGG	GGGGGGGG
384-512	GGGGGGGG	GGGGGGGG
512-640	GGGGGGGG	GGGGBGGB

Figure 3-5: Visual Display of Range Requested on the AT

The Range display provides the real address of the 128K blocks tested plus the 16 data bits and 2 parity bits (D0 - D7P) (D8 - D15P).

# How to Identify Which Chips Are Bad

The rows across on the screen correspond to banks on the card. The columns going down on the screen correspond to chips within a bank. The columns under P correspond to parity chips.

Each row on the screen corresponds to 2 banks on the card. (This is because the AT tests 128K instead of 64K at once.)

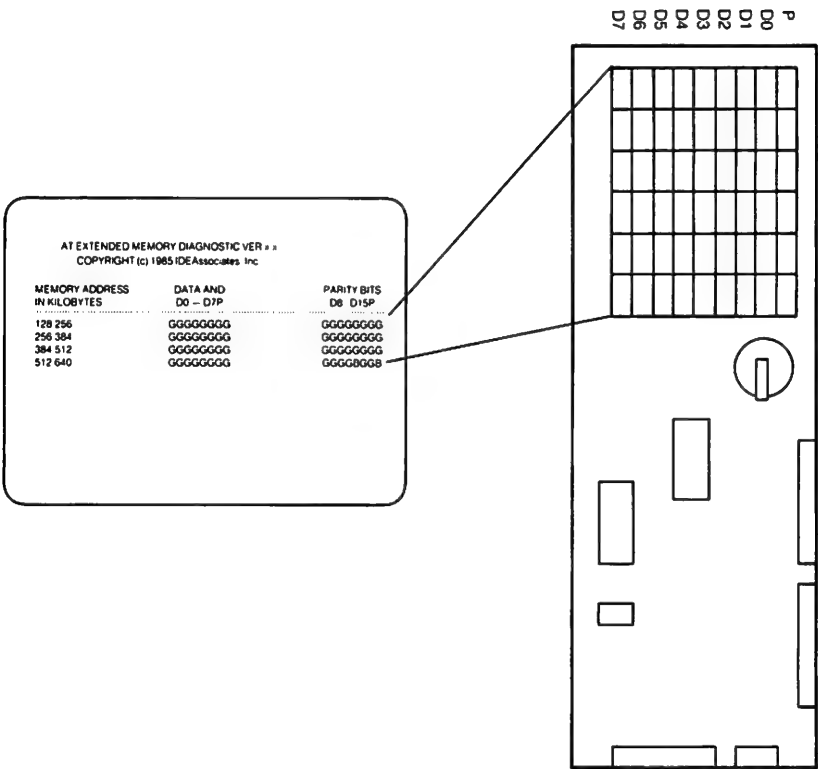


Figure 3-6: General Address Correspondence on the AT



---

If all data tested was all right, a 'G' is displayed under each data bit and parity bit. If a data error or address error occurred during testing, the bit(s) associated with the questionable data displays a blinking 'B' under the bit(s). When a data error occurs, the parity bits associated with that 128K block also blink (even if they passed the diagnostics test). This shows normal parity operation since data read is not equal to data written. If no data bits have a blinking B and the parity bit IS blinking, there is a parity chip problem.

However, there is one adjustment to make. You must figure the starting address in memory of your IDEAmx card and count forward from there on the screen to arrive at the proper bank. (You entered the starting address of your IDEAmx card in Section II.) To locate the bank with the particular memory chip you need to examine, you must know your starting address (the number you entered into the box on page 2-17).

To find the memory chip, use the DATA BITS locations (Figure 3-5). The data bits locations start with D0 and end with D7 for the first half bank. The second half bank begins with D8 and ends with D15. In this example, the blinking B is located at D12. D12 gives you the position within the bank of the chip you want but it does not tell you which bank you need.

Refer to the MEMORY ADDRESS in KILOBYTES column in Figure 3-6. This column lists 128K blocks of memory. Locate your starting address in the Kilobytes column. In this example, 256K is the starting address located in bank 1. If the blinking "B" is located in the 512K range, the error would be found in Memory Bank 3, slot 12 of the IDEAmux card.

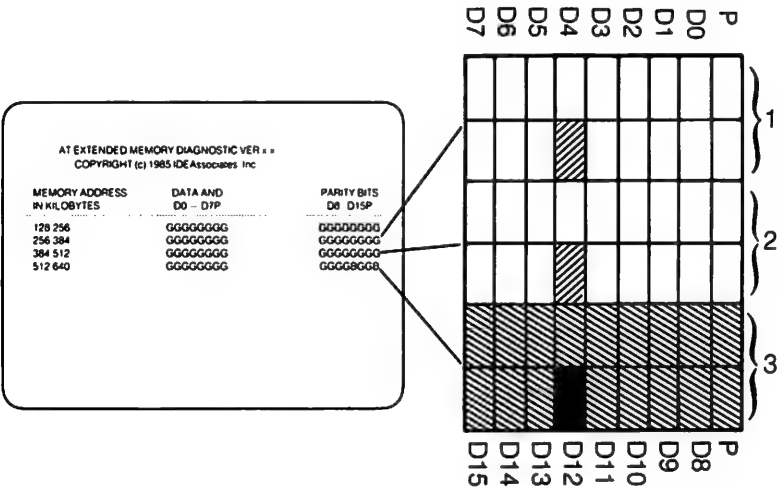


Figure 3-7: Address Correspondence on the AT, Cont'd

---

As each line is displayed on the screen, twenty-one tests are performed on each 128K block of memory. To stop the display from printing, press CTRL NUM LOCK.

To exit from the diagnostic program before normal completion, press CTRL-BREAK.

---

# Diagnostic Messages

The following error message may be displayed.

Message: "error shrinking current program"

Cause: Most likely insufficient memory to run or load memory diagnostic

Action: Make sure you have loaded IDEMTD at the lowest possible memory location. No drivers, cache buffers, etc., should be loaded prior to memory diagnostics. If you determine that this is not the problem, type the following from the command line:  
ATMEM.

Once the ATMEM command is executed, the program reads the amount of memory indicated on your AT and outputs this information to the display (this information comes from IBM's Setup program).

A memory map is created as the program is run. The map finds and displays 128K functional memory blocks within each megabyte of memory in the same way as Figure 3-4. A "G" is displayed for functional memory and an "X" is displayed for nonexistent or nonfunctional blocks.

If the map displays an X between blocks displaying G's an error message is displayed which reads "Warning - non contiguous memory."

Message: Warning - non contiguous memory

Cause: Wrong switch settings or bad memory chips. You may have set the start address of extended memory on the IDEAmx card wrong.

Action: Check switch settings. If they are correct, continue with the test.

Message: not enough characters entered

Cause: You did not enter the minimum amount of characters for row,col entry.

---

Action: Enter at least 3 characters using a comma (,) as a delimiter.

Message: no delimiter (,) between row and column

Cause: You failed to enter a comma (,) between the row and column entry.

Action: Re-enter data using a comma (,) between the row and column entry.

Message: invalid row entry

Cause: You entered an invalid row number.

Action: Re-enter a valid row number (0 - 15).

Message: invalid column entry

Cause: You entered an invalid column number.

Action: Re-enter a valid column number (0 - 7)

Message: end row, column must be equal or greater than start row, column

Cause: You entered an ending address that was lower than the start address.

Action: Re-enter end row, column.

Message: invalid entry — program resident area

Cause: You entered a start address that was within the program area.

Action: Enter a higher row, column number or try running the program from the command line with IDEMTD.

Message: invalid entry - system reserved area

Cause: You entered a start address that was within the RESERVED area.

Action: Enter a row, column number that is not within the system reserved area (the area labeled RESERVED on the screen display of memory).

---

---

Message: Not enough memory after program residency to use this option.

Cause: There is not enough memory to test.

Action: Load the test program at the lowest memory location available. Drivers, cache, buffers, and AUTOEXEC files should not be loaded when this memory diagnostic is run. You can also use the range option to test small portions of memory.

Message: Input error — start address in program resident area.

Cause: In the range option, the user selected a start address that was within the program location.

Action: Enter a new start address.

---

## Other Troubleshooting Hints

This section covers common problems you may encounter using your IDEAmix Combination Card. It should help you identify and correct minor memory, parallel port, serial port, and clock/calendar problems.

If you cannot resolve the problem yourself, you may call IDEAssociates Technical Support Department at (800) 257-5027.

---

# Memory Problems

If upon starting up your IBM you get a "PARITY CHECK 2" or "XXXX 201" error message, there is a problem with the some portion of the memory.

- If the value of XXXX in the "XXXX 201" error message is less than 1000, you have a system board memory problem (see "Problems Not Related to Option Memory" below).
- If the value of "XXXX" is greater than 1000, you have an option memory problem. For any other error messages, see "Problems Not Related to Option Memory."
- For the AT, the meaning of parity messages is explained on page 3-13.

Option memory problems generally fall in one of the following categories:

- Switches on the IBM PC, the IDEAmx card or other option memory board are set incorrectly.
- Part of the option memory is not functioning correctly.

## Incorrect Switch Settings

If you have just installed the IDEAmx card, the switches may be set incorrectly, causing overlapping or gapping in the memory. Go to "Setting Switches," Section II and check all switch settings. Correct the settings and follow the rest of the installation procedure. At startup, the "PARITY CHECK 2" message should not appear.



---

## Non-Functioning Option Memory

If all the switches are set correctly, use the IDEA Memory Test to find the non-functioning memory.

Here are the steps you should take:

- Note IBM Switch Bank 2 settings.
- Reset IBM Switch Bank 2 to indicate zero option memory installed. (See Section II.) The IBM PC powerup memory check will not run correctly unless this is done.
- DO NOT CHANGE IDEA SWITCH BANK 1.
- DO NOT REMOVE THE IDEAmAX CARD.
- Replace the cover and power up the IBM PC. If the IBM PC memory check runs without error, then you have an option memory problem.
- Turn to "The Memory Test" in this section for your system and follow the instructions for running the diagnostics. The Read/Write Memory Test will identify the portion of your option memory that has failed.

---

## Testing the IBM PC Without the IDEAmix Card

If the IDEA Memory Test does not reveal any non-functional option memory, take the following steps:

On the PC or XT:

- Note your current switch settings.
- Remove the IDEAmix Card.
- Reset the switches to correspond to their original settings as recorded in Section II.
- Restart the system.

On the AT:

- Run the diagnostics program on the IBM Diagnostics Diskette. Follow the instructions in the IBM *Installation and Setup Guide*.

If the IBM memory check is completed successfully, please call IDEA Customer Service at (800) 257-5027. In order to help you, our technicians will ask you for the following information:

- The amounts of memory on your system board, IDEAmix Combination Card, and any non-IDEA option memory boards.
- Your original switch settings.
- The switch settings after the IDEAmix Combination Card installation.
- The serial number of your IDEAmix Combination Card.

---

## Problems Not Related to Option Memory

If one of the following error messages appears when you start up your system, go to "Printer Problem Determination Procedures" in the *IBM Guide to Operations*.

199

432

901

1401

If you get any other error messages, please refer to "Problem Determination Procedures" in the *IBM Guide to Operations*.

Typical problems are:

- Keyboard connector reattached to wrong slot.
- Loose printed circuit boards.
- Loose connectors for printer, disk drive, or monitor.

---

## Parallel Printer Port Problems

Should the printer not function or print garbled text, check the following points:

- Make sure that the printer is supported by the IBM PC and its operating system.
- Check the independent operation of the printer with the "self-test," if available. The self-test for the IBM PC printer is discussed in "Printer Problem Determination" in the *IBM Guide to Operations*.
- Check for loose connections and improper cabling.
- Check the switch settings on the IDEMax Combination Card.
- Check the software/hardware compatibility. See Appendix E, and review interface connection diagrams.

---

## Serial Port Problems

The RS232C Serial Communication Port on the IDEAmix Card meets all specifications for the RS232C standard supported by the IBM Asynchronous Communications Controller. The signal names and directions are shown in Appendix E.

The majority of the RS232C signals are used to control modems for communication to and from phone lines. However, many serial printers do not support all RS232C functions. A special cable may be required to assure that the IBM PC can communicate with your printer.

In addition, all printers do not support the same control characters. This means that even if the cable is correct, the IBM PC may not send the correct printing sequence. The safest course is to use a printer that IBM supports. Use of an unsupported printer may require special software.

If the device (modem, printer, etc.) does not function properly, check the following items:

- Check independent operation of the device using "self-test" programs, if available.
- Check for loose connections and improper cabling.
- Check switch settings on the IDEAmix Combination Card. Review Section II.
- Check software/hardware compatibility. See Appendix E, and review interface connection diagrams.

---

## Real Time Clock Problems

### Incorrect Time/Date

If the time or date is incorrect, reset the time/date as shown in Section IV: IDEAMenu.

### No Time/Date (Battery Replacement)

The battery supplied with the clock/calendar will last for one year. If no time/date appears, or a row of question marks appears in its place, the battery has probably worn out. IDEAssociates recommends the Panasonic BR2325 battery for replacement.


To replace the battery, see Figure 1-1 for battery location. Carefully remove the IDEAmux card from the PC following the the insertion steps in Section II in reverse order. Once the card has been removed, slip out the old battery and install the new one with the "plus" side away from the board. Reinsert the card using the directions at the end of Section II.

The Real Time Clock is not needed for the AT. Attempts to use the IDEA clock with the AT may lead to unpredictable error messages.

---

## **Section IV:**

# **IDEAmax Software (IDEAmenu)**



This section describes the installation and use of IDEAmenu, menu-driven software that accompanies your IDEAmax Combination Card.

IDEAmenu allows end-users to configure their boot diskettes to improve the efficiency and performance of their systems. End-users can individualize their systems to perform a number of functions:

- invoke the print spooler at startup time
- answer the DOS date and time prompts at startup time
- update a file's time and date to the current system time
- time an executable program or command
- configure a RAMFLOPPY (virtual diskette)
- search files for patterns
- perform diagnostics for memory and game ports

---

NOTE: The distribution diskette containing IDEAMenu is equipped with programs that may or may not be applicable to your system. IDEAMenu issues on-line messages to remind users that without certain peripherals or with certain systems, some functions will not work..

IDEAMenu is composed of four menus: the Configuration Menu, Utilities One, Utilities Two, and Diagnostics. Within each menu are function keys that perform specific tasks. Both Utilities Menus reserve the function keys F9 and F10 for selecting a Previous Menu (F9) or a Next Menu (F10).

Once you are familiar with IDEAMenu, you can execute functions from the command line as well.



---

At the system prompt, type:

**IDEAMENU**

and the Configuration Menu displays:

system memory xxxK	IDEAssociates	memory avail.xxxK
parallel(s)		serial(s)
x		x
game		floppy(s)
x		x
IDEAmenu Configuration		
F1. Help		
F2. Return to System		
F3. Configure Ramdisk		
F4. Set Real Time Clock		
F5. Add RAMFLOPPY to CONFIG.SYS		
F6. Add Real Time Clock to AUTOEXEC.BAT		
F7. Configure Printer Spooler		
F8. Reboot System to Install Devices		
ENTER FUNCTION KEY:		F10 Next Menu

Figure 4-1: Configuration Menu

---

# Configuration Menu

The Configuration Menu lists function keys F1 - F8 and F10. At the top of the screen, certain areas are blocked off, containing information specific to your system's configuration.

It is important to set the switches correctly, because IDEAmenu reads the number of devices installed: floppies, parallel, serial and game ports, monitors, whether they are BW or color, additional boards, and system memory from the switch settings.

HELP information is available for all four menus: Configuration, Utilities One, Utilities Two, and Diagnostics. Pressing F1 followed by another function key displays a HELP page for that function key.

NOTE: Refer to Appendix A for each function key's use, and for information about examples, options, and notes.

The following summarizes each function key:

- F1 Help displays HELP information for each function key and presents an overview of IDEAmenu.
- F2 Return to System exits IDEAmenu and returns to DOS.
- F3 Configure RAMdisk configures the amount of RAM memory, in increments of 32K, you wish to install as a Ramdisk. Enter the size of memory for Ramdisk, reserving 128K for the system. (AT users may use the VDISK command instead.)

- 
- F4 Set Real Time Clock executes the program IDETIME.COM which retains the correct time even if the system is off. (This is not needed for the AT, which has its own clock.)
  - F5 Add RAMFLOPPY to CONFIG.SYS inserts the device driver statement IDERAM2.SYS in the CONFIG.SYS file, if one is not already included. Preserves other installed devices. (AT users may also use IBM's VDISK.)
  - F6 Add Real Time Clock enters the program IDETIM2.COM in the AUTOEXEC.BAT file to display the time and date at bootup. Does not destroy existing entries. (This is not needed for the AT.)
  - F7 Configure Printer Spooler invokes the Print Spooler Menu below.
  - F8 Reboot System to Install Devices reboots system and install devices.
  - F10 Next Menu advances to the next menu.

NOTE: Function keys F5, F6, and F7 create a file if one does not already exist. Existing files must be less than 100 lines and less than 132 characters in line length.

---

# The Print Spooler Menu

The IDEA Print Spooler Software will increase your productivity by enabling you to work on the computer during printing. The Spooler is compatible with most IBM PC software packages.

When the Spooler program is loaded into the computer's memory, the machine thinks that the program is actually the printer. When you tell the computer to print a file (from the operating system level, or from within a program), the Spooler takes the output and stores it in its memory buffer. The Spooler then sends the data to the printer, but only as fast as the printer can accept it. As soon as the Spooler stores the file, the computer is free to process commands. You will be able to use the computer even while the printer is running.

If you send a file to the printer that is larger than the spooler's memory buffer, you will notice that you will not be able to continue working until part of the file has been printed. This is to be expected; the Spooler is waiting for enough of the file to be printed so that unprinted portion will fit in the buffer. Function key F7 allows you to set a larger buffer for the spooler.

---

Below is the Spooler Menu. From this menu, you may press F1 to get more information for each of the other options.

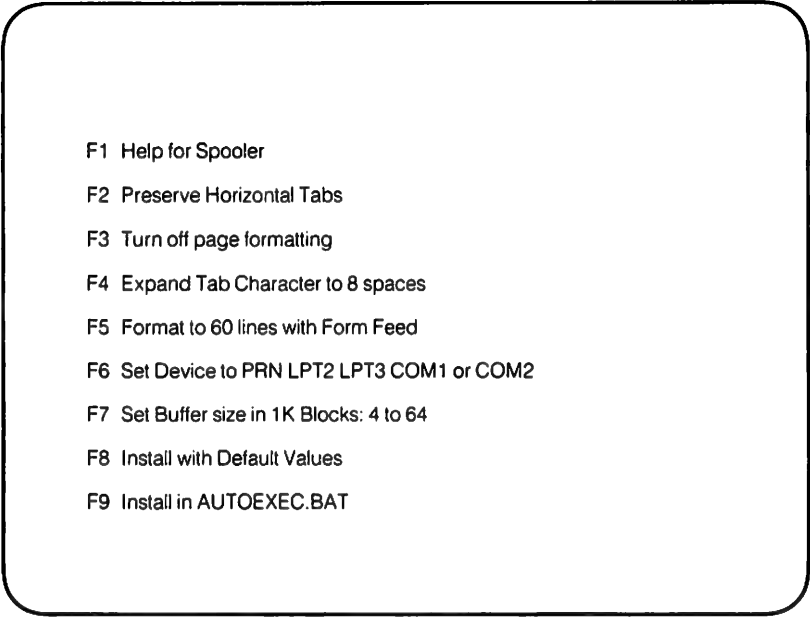
- 
- F1 Help for Spooler
  - F2 Preserve Horizontal Tabs
  - F3 Turn off page formatting
  - F4 Expand Tab Character to 8 spaces
  - F5 Format to 60 lines with Form Feed
  - F6 Set Device to PRN LPT2 LPT3 COM1 or COM2
  - F7 Set Buffer size in 1K Blocks: 4 to 64
  - F8 Install with Default Values
  - F9 Install in AUTOEXEC.BAT

Figure 4-2: Print Spooler Menu

The help file for this menu is summarized in Appendix A.

# Utilities One Menu

From the Configuration Menu in Figure 4-1 , press F10 and the Utilities One Menu appears, listing function keys F1 through F10.

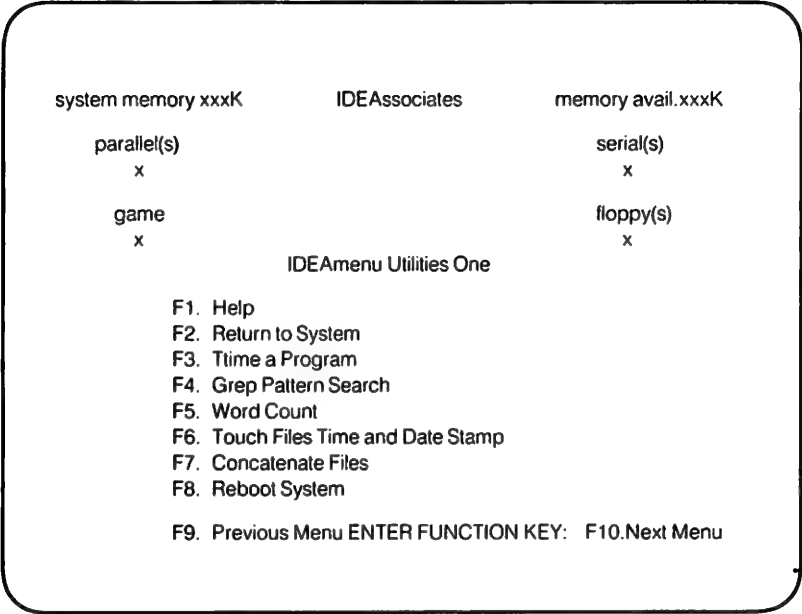


Figure 4-3: Utilities One Menu

These utilities perform a number of functions to increase system performance and user productivity.

NOTE: Refer to Appendix A for each function key's use and for information about examples, options and notes.

- 
- |                          |   |
|--------------------------|---|
| ● F1 Help                | displays HELP information for each function key and presents an overview of IDEAmenu.   |
| ● F2 Return to System    | exits IDEAmenu and returns to DOS.  |
| ● F3 Time a Program      | displays the time it takes to execute a program. This function enables a user to measure the efficiency of an algorithm or program.                       |
| ● F4 Grep Pattern Search | searches each file for a pattern and prints each line matching the pattern. If a file is not specified, GREP searches the standard input (keyboard) file. |
| ● F5 Word Count          | counts words, lines and characters in a file. If a file is not specified, Word Count searches the standard input file.                                    |
| ● F6 Touch File          | updates a file's time and date stamp to record the current time and date or an arbitrary time and date.   |
| ● F7 Concatenate         | joins any number of files to create a new file or adds files to an existing file.   |
| ● F8 Reboot System       | reboots the system  |
| ● F9 Previous Menu       | returns to the earlier menu.  |
| ● F10 Next Menu          | advances to the next menu.  |
-

---

# Utilities Two Menu

From the Utilities One Menu, press F10 and the Utilities Two Menu appears, listing function keys F1 through F10.

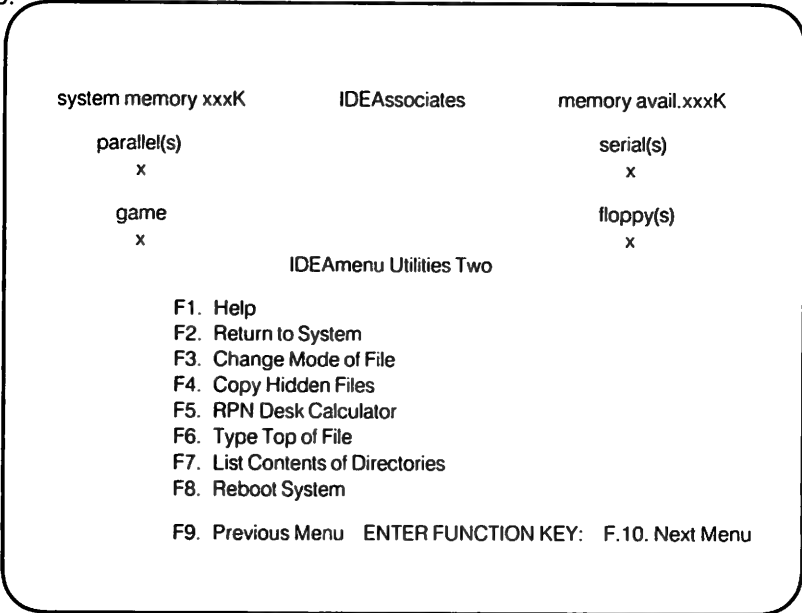


Figure 4-4: Utilities Two Menu

NOTE: Refer to Appendix A for each function key's use and for information about examples, options and notes.



- 
- |                        |   |
|------------------------|---|
| ● F1 Help              | displays HELP information for each function key and presents an overview of IDEAmenu  |
| ● F2 Return to System  | exits IDEAmenu and returns to DOS.  |
| ● F3 Change Mode       | changes attributes of a given file.   |
| ● F4 Copy Hidden Files | copies hidden and read-only system files while preserving any attributes.   |
| ● F5 Desk Calculator   | performs addition, subtraction, multiplication, division, exponentiation, and hexadecimal arithmetic (Reverse Polish Notation). |
| ● F6 Type Top of File  | displays the first x number of lines in a file.   |
| ● F7 List Contents     | lists files in a directory.   |
| ● F8 Reboot System     | reboots system and returns to DOS.  |
| ● F9 Previous Menu     | returns to the earlier menu.  |
| ● F10 Next Menu        | advances to the next menu.  |

# Diagnostics Menu

From the Utilities Two Menu, press F10 and the Diagnostics Menu appears, listing function keys F1, F6, F8, and F9.

NOTE: Function Key F7 is not active in this menu.

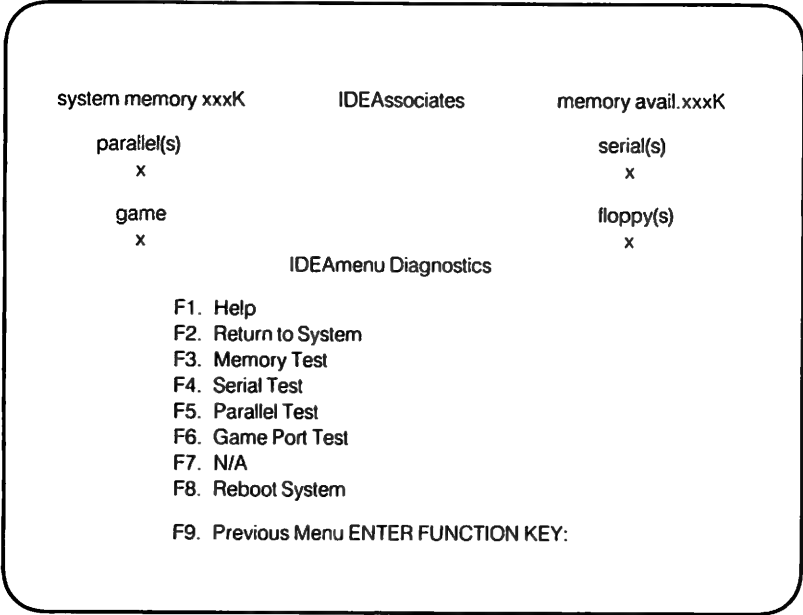


Figure 4-5: Diagnostics Menu

NOTE: Refer to Appendix A for each function key's use and for information about examples, options, and notes.

- 
- |                       |  |
|-----------------------|--|
| ● F1 Help             | displays HELP information for each function key and presents an overview of IDEAmenu.  |
| ● F2 Return to System | exits IDEAmenu and returns to DOS.   |
| ● F3 Memory Test      | checks that switch settings are correct and the memory banks are operating properly.   |
| ● F4 Serial Test      | displays the addresses of each installed serial port.  |
| ● F5 Parallel Test    | displays the addresses of each installed parallel port. The functionality of the port is tested by comparing a video output with printed output. |
| ● F6 Game Port Test   | ensures that the game port is working properly.  |
| ● F8 Reboot           | reboots system and returns to DOS.   |
| ● F9 Previous Menu    | returns to the earlier menu.   |



---

# Appendix A: IDEAMenu Functions



## How To Use This Appendix

This appendix contains a summary of the HELP files for each function in IDEAMenu and its subordinate menus. Some of these functions may also be invoked from DOS through a command line. For such functions, the command line syntax is discussed under the heading Usage.

---

# Configuration Menu

Congratulations on your purchase of an IDEAssociates Combination Card for the IBM Personal Computer.

Before running this program you should have installed the combination card and reconfigured the system's board and/or the combination card's switch settings to reflect the additional devices and resources installed.

When you run the IDEAmenu install program the menu will display pertinent system information and a selection of choices. This help file is displayed when the F1 function key is pressed. The menu will query the operating system's device vector to determine the devices installed and the available system memory. This will aid you in determining if the switches are set correctly. Carefully inspect and reset the switches if the display reports devices or resources other than what you have installed. If problems still persist please call your dealer or IDEAssociates Customer Support.

Please remember to fill out the warranty registration card and return it to IDEAssociates.

---

# Configure Ramdisk

## Configuration Menu

This selection configures the size of the RAMFLOPPY that you may wish to use. The RAMFLOPPY software reserves a selected amount of the main memory for use as a simulated floppy disk. Once the RAMFLOPPY program is in place, transfers to and from the RAMFLOPPY proceed 50 times faster than accesses to normal floppies. This function will allow you to set the size of the RAMFLOPPY disk. The size of the RAMFLOPPY may be specified in increments of 32k.

Remember to leave at least 128k of memory for system use. The available memory is displayed in the upper right corner of the menu display.

See also F5.

---

# Set Real Time Clock

## Configuration Menu

This selection allows you to set the time and date of the on board clock. The clock will keep the current time and date even if the system is powered down. An entry in an AUTOEXEC.BAT file will automatically answer the DOS Time and Date questions and display the time and date on the screen.

The F6 function will create or edit the AUTOEXEC.BAT file and place the proper text in the file for automatic date and time.

This function is unnecessary with the AT, which has its own real time clock.



---

# Add RAMdisk to CONFIG.SYS File

## Configuration Menu

This selection will edit or create a file called CONFIG.SYS. This function will place an entry in the file to tell DOS to install the RAMFLOPPY as a DOS device driver. The device drivers are assigned drive letters in the order they appear in the file. The function will place the device driver at the beginning or the end of the file. If the file does not exist it will be created. More than one RAMFLOPPY may be installed, but this program will allow only one entry to be placed in the file. The F3 function configures the size of the RAMFLOPPY. Remember to leave at least 128k main memory for the system use.

NOTE: To use RAMFLOPPYs of different sizes you must first configure the size of the device driver and then rename the file to another file name such as RENAME IDERAM2.SYS IDERAM22.SYS. After all, a name is just a name. Then configure the size for the other RAMFLOPPY. Edit the CONFIG.SYS file and place the entry DEVICE = IDERAM22.SYS and DEVICE = IDERAM2.SYS in the file.

See also F3.

---

# Add Real Time Clock to AUTOEXEC.BAT

## Configuration Menu

This function will edit the file AUTOEXEC.BAT to place an entry in the file to automatically answer the DOS Time and Date questions upon a reboot. The time and date will be read from the IDEA clock and transferred to DOS so that the time and date questions need not appear.

See also F4.

This function is not necessary for the AT, which has its own real time clock.

---

# Configure Printer Spooler

## Configuration Menu

This function will edit the file AUTOEXEC.BAT to add entries for the print spooling function. If the IDESPOOL entry exists in the AUTOEXEC.BAT file it must be deleted before new spooler parameters can be configured. The IDEAssociates print spooler is a general purpose spooler that is used in the network as well as a single system unit. You may, however, elect to use the DOS print spooler PRINT.COM. If you use the DOS PRINT.COM then edit the file AUTOEXEC.BAT and place the file name in the file. Do not use both.

Help for the configuration of the print spooler is available by selecting the F7 function and then selecting help under the print spooler configuration menu.

---

# IDESPOOL

## Configuration Menu

Installs IDE Print Spooler. The first time this command is issued, it increases the resident size of DOS by approximately 10k bytes (larger if a larger buffer size is chosen). The Spooler uses background processing software which is contained in GENSKED.EXE & TIMESKED.EXE. Therefore you must install both of these programs before installing the Spooler.

Usage: IDESPOOL -option1 -option2 ...

The command is both parameter and menu driven. If the command is entered without any parameters the menu is displayed and the user is requested to choose one of the available menu options. If the command is entered with parameters then the parameters are processed and the spooler installed if appropriate. All parameters must be separated by spaces. The following parameters are available:

- ? If a question mark is the only parameter entered, this on-line file is displayed.
- xx Spooler buffer size in 1K blocks: 4 to 64. The buffer size may only be changed when the spooler is first installed.
- device Installs device: PRN, LPT2, LPT3, COM1, or COM2.
- D Installs the Print Spooler to spool data to disk. This mode may only be changed when the spooler is first installed.
- E Expands horizontal tab character to tab stops every 8 characters.
- F Formats printing into 60 lines per page with form feed between pages.
- I Installs the Print Spooler with default values: 4K buffer and PRN device.
- P Preserves horizontal tabs.
- T Terminate all printing in progress.
- U Unformat pages, Turn off page formatting.

---

\* MAIN MENU HELP \*

- |                                   |  |
|-----------------------------------|--|
| F1 - Display help file.           | F2 - Select Spooler Mode.<br>-Configure Spooler to send data to memory.<br>-Change tab expansion mode. |
| F3 - Select Spooler buffer size.  | F4 - Select Spooler Device.<br>-Add device as spool device.<br>-Delete device as spool device.         |
| F9 - Exit and cancel all changes. | F10 - Exit and install all changes.  |

\* MODE MENU HELP \*

- |   |   |
|---|---|
| F1 - Display help file.   | F2 - Configure Spooler to spool data to memory. |
| F3 - Configure spooler to expand tabs into spaces, with tab stops every 8 characters. | F10 - Exit menu, return to previous menu        |

---

\* CHANGE DEVICE MENU HELP \*

- |                                       |   |
|---------------------------------------|---|
| F1 - Display help file.               | F2 - Add device as a spool device. If already installed, devices can be added up to the maximum number for the current configuration. If installed as a single device then the current spool device can be changed. |
| F3 - Delete device as a spool device. | F10 - Exit menu, return to previous menu.   |

\* DEVICE MENU HELP \*

- |                          |   |
|--------------------------|---|
| F1 - Display help file.  | F2 - Select PRN/LPT1 device.              |
| F3 - Select LPT2 device. | F4 - Select LPT3 device.                  |
| F5 - Select COM1 device. | F4 - Select COM2 device.                  |
|                          | F10 - Exit menu, return to previous menu. |

---

# Utilities One Menu

The utilities provided are as follows:

- time - will time the execution of a program.
- grep - a pattern search utility more powerful than DOS FIND.
- wc - a word count program.
- touch - updates a files time and date stamp.
- cat - concatenate files or type them to the screen.

To execute a program press the function key corresponding to the name of the program and then enter any arguments (such as options or filenames) and press return. The program will execute and will then wait for any key press to return to the main menu.

---

# Ttime—Time an Executable Program

## Utilities One Menu

Usage: `ttime [d:][path]filename.ext [arguments]`

Options: The filename extension must be either '.com' or '.exe' or an error will be reported. Arguments may be passed to the executable file.

Example:

```
ttime \usr\bin\touch.exe -d12/12/84 *.c
```

Will time the execution of the touch.exe program and will pass the arguments -d12/12/84 and \*.c to the executable program touch.exe. ttime will report:

time used 15.2 seconds

This utility provides a method of optimizing user written programs. The time reported is not the true time used by the executable program because the time required to load the program is a component of the total time reported. However, the load time should remain somewhat constant unless the file grows or shrinks in length or the file gets fragmented on the disk. Thus the efficiency of an algorithm or program may be measured as a function of execution time.

### NOTE:

The file extension must be included or an error will occur and the extension must be either .exe or .com. A way of determining the load time is to compile a program that terminates immediately. Then ttime the program and the time reported should be the load time. For extremely large programs a modified main routine that exits immediately will give an approximation to the load time.

This function is unnecessary with the AT, as it is for use only with IDEAssociates' real time clock.



---

# GREP Pattern Search

## Utilities One Menu

Usage: `grep [-option] [pattern] [file...]`

### Options:

- b With each output line, print the block number in which the line started.
- c Print the count of matching lines rather than the lines.
- e The next argument is the pattern (useful if the pattern starts with '-').
- l Print the name of each file containing matching lines rather than the lines.
- n the line number in the file accompanies each line printed.
- v Print a line if the pattern is not found in the line.
- w Print the line only if it contains exactly the pattern; treat wildcards in the pattern as plain text.
- y, -i Lowercase letters in the pattern match both lower and uppercase letters on the input lines.

### Example:

`grep getchar hello.c`

Will search through the file named `hello.c` for all occurrences of the string `"getchar"`

### NOTE:

Grep searches each file for occurrences of the pattern. If no file is specified, Grep searches the standard input (i.e., keyboard input). The pattern may be in quotes and may include wildcards.

---

# Word Count

## Utilities One Menu

### Usage:

`wc [-lwcpt] [-v] [-u] [-spage'size] [-bbaudrate]  
[d:][path][filename.ext]`

### Options:

- l count lines
- w count words
- c count characters
- p pages with 66 lines per page as a default  
(override with -s)
- t time required to transmit file at baud rate  
specified.
- v verbose .. all of the above
- sNN l any page size; default is 66
- bNNNN any baud rate; default is 300
- filenames may include drive designators, paths, and  
wildcards.

### Example:

`wc -v -b1200 c:\usr\dave\*.c`

Will return the lines, words, characters, pages, and the time required to transmit the file over a 1200 baud communications link.

### NOTE:

wc counts words, lines, and characters in each file named. If no file is given, wc uses the standard input (i.e., keyboard input). If more than one file is given, wc also prints a total. A word is defined as a maximal string of characters surrounded by whitespace (blanks, tabs, or newlines).

---

# Touch Files Time and Date Stamp

## Utilities One Menu

### Usage:

`touch [-dmm/dd/yy] [-thh:mm] [d:][path] filename.ext.`

### Options:

`-d` the month/day/year for date stamp the file

`-t` the hour:minutes for the time stamp.

if an option is missing the current system time and/or date will be used as the stamp.

### Example:

`touch -t1:1 c:\usr\dave\*.c d:\usr\eric\*.*?`

Will update the file time stamp on all the files on drive c: in the directory \usr\dave that have the extension of '.c' and all the files on drive d: in the directory \usr\eric that have the extension of any two characters. The date will be the current DOS date and the time will be 1:01 am.

`touch -d12/12/84 -t12:12 *.h`

Will change the date and time stamp of all the files in the current directory that have the extension of '.h' using the time 12:12pm and date to DEC 12, 1984.

NOTE: This command is very useful for backing up hard disks with the date option. Valid dates must be greater than 1/1/80 and less than 12/31/2000. Valid times must be in the range of 0 to 24 hours and 0 to 59 minutes. A time of 0:0 will remove the time from the directory listing. An invalid or missing entry will cause the system date and/or time to be used as the default. Dates such as 2/29/yy during leap years are checked and permitted.

---

# Concatenate Files

## Utilities One Menu

### Usage:

cat [-cegnstv] [d:][path] filename.ext

### Options:

- c count the number of characters in the file.
- n display the line number with the text.
- s single space text.
- g strip out graphics characters (upper 128 ASCII characters).
- m will display the message —more— and pause for any keystroke every 23 lines of the file.
- t replace tabs with the character sequence `^I`
- e show end of line with the character `$`.
- v verbose includes the -t and -e options.

Example: cat -cs \*.c < transmit.txt

Will type all the files in the current directory that have the extension of 'c' and will strip off graphics characters, print line numbers, and will redirect the output to the file TRANSMIT.TXT.

---

# Utilities Two Menu

The utilities provided are as follows:

- chmod - change the attributes of a file.
- scopy - allows copying of special hidden/system files.
- dc - an unlimited precision RPN desk calculator.
- head - text utility to type the first n lines of a file.
- ls - extended DOS DIR program.

To execute a program press the function key corresponding to the name of the program and then enter any arguments (such as options or filenames) and press return. The program will execute and will then wait for any key press to return to the Utilities Two menu.

---

# Change Mode of File

## Utilities Two Menu

### Usage:

`chmod [-options] [d:][path] filename.ext`

### Options:

- a reset archive attribute to NOT backed up. This is useful for multiple backups of the same directory.
- h set attribute to a hidden file which is excluded from normal directory search. (can be listed with LS.COM however)
- r set attribute to read only. Prevents accidental deletion.
- s set attribute to system file.
- g set attribute to general backed up file.

### Example:

`chmod -ra c:\usr\dave\*.c`

Will change the file attribute of all the files on drive c: in the directory \usr\dave\ that end with the extension of c. The attribute is read only NOT backed up.

### NOTE:

The options -hrs and -g are mutually exclusive. A file can either be general or can be any combination of hidden/system/read only. The -a option can be used with any other options.

---

# Copy Hidden Files

Utilities Two Menu

Usage:

scopy [d:][path] source.ext [d:][path]destination.ext

Options:

Source.ext and destination.ext must be valid filenames.

Example:

scopy a:ibmbio.com c:test.com

Will copy the hidden/system file ibmbio.com on drive a: to drive c: with the new name of test.com. The file attributes will remain hidden/system.

NOTE:

This is useful for copying read only files as well.

---

# RPN Desk Calculator

## Utilities Two Menu

Usage: dc [file]

dc is an arbitrary precision desk calculator. It simulates a stacking calculator with ancillary registers. Input must be entered in reverse Polish notation. This means that an operator follows its operand or operands. Thus, to multiply 11 by 12, enter:

11 12 \* <CR>

To print the result of this calculation, enter:

11 12 \* p <CR>

DC may read input from file if specified, and then from the standard input. dc accepts an arbitrary number of commands per line; moreover, spaces need not be left between them.

DC maintains the expected number of decimal places during addition, subtraction, and multiplication, but the user must make an explicit request to maintain any decimal places at all during division.

The scale factor of a number is the number of places to the right of its decimal point. The scale factor register controls decimal places in calculations. The scale factor does not affect addition or subtraction. It affects multiplication only if the sum of the scale factors of the two operands is greater than it. The result of every division command has as many decimal places as it specifies. It affects exponentiation in that multiplication is performed as many times as the integer part of the exponent indicates; any fractional part of the exponentiation is ignored.

## dc COMMANDS AND CONSTRUCTS

### number

Place the number on the stack. A number is a string of symbols taken from the set of digits '0-9' and the set of capital letters 'A - F' (usual hexadecimal notation), with an optional decimal point. An underscore as a prefix indicates a negative number. The letters retain values of 10 - 15 respectively regardless of the base chosen by the user.



---

+ - / \* %

The arithmetic operations : addition(+), subtraction(-), division(/), multiplication(\*), remainder(%), and exponentiation( $\pm$ ). dc pops the two top stack elements, performs the desired operation by calling the multiprecision routine desired and stacks the result.

- c Clear the stack. Does not clear registers.
- d Duplicate the top of the stack so that it occupies the top two locations of the stack.
- f Print the contents of the stack and the values of all the registers.
- i Remove the top of the stack and use its integer part as the assumed input base (default 10). The new input base must be greater than 1 and less than 17.
- I Stack the current assumed input base.
- k Remove the top of the stack and put it in the internal scale factor register.
- K Put the value of the internal scale factor register (which the k command sets) on the top of the stack.
- lx Load the value of the register 'x' to the top of the stack. The value of register 'x' is unaltered. X may be any character.
- o Remove the top of the stack and use its integer part as the assumed output base (default 10). The specified base may be any positive integer.
- O Stack the current assumed output base.
- p Print the top of the stack. The value remains on the stack.
- q Quit the program; control returns to command.com or to the Utilities Menu.
- sx Remove the top of the stack and store it in register 'x'. The previous contents of 'x' are destroyed. 'x' may be any character.
- v Replace the top of the stack by its square root.

- 
- x Remove the top of the stack, interpret it as a string containing a sequence of dc commands, and execute it (see also [...] below.)
  - X Replace the top of the stack by its scale factor (i.e. the number of decimal places it has).
  - z Place the number of occupied levels of the stack on the top of the stack.
  - [...] Place the bracketed character string on the top of the stack. The string may be executed subsequently with the x command.

<x >x = x !<x !>x != x

Remove the top two elements of the stack and compare them. If there is no '!' (NOT) sign before the relation, execute register x if the two elements obey the relation. If a '!' (NOT) sign is present, execute register x if the elements do not obey the relation.

Error messages:

"stack empty" not enough stack elements to performed command as requested. "Out of pushdown" no more room on the stack. "Nesting depth" too many nested execution levels "Out of space" too many digits demanded "Out of headers" too many numbers being stored.

Examples:

The following example program prints the first twenty Fibonacci numbers: NOTE: the 'L's are typed in uppercase in the example to distinguish the ells (letter l) from ones (number 1). They must be entered in lowercase!!

```
1sa1sb1sc [LaLbdsa + psbLc1 + dsc21 x y]sy Lyx
enter as
```

```
1sa1sb1sc [lalbdsa + psblc1 + dsc21 x y]sy lyx
```

The following example program multiplies 12 and 11 and then raises 10 to the power of the resulting multiplication and prints it.

```
10 11 12 * ^ p
```

---

# Type Top of File

## Utilities Two Menu

Usage:

`head [-n] [d:][path]filename.ext` the default is 10 lines.

Example:

`head -5 c:\us\dave\*.c`

Will report the file name (if more than one file has an extension of '.c') and type the first 5 lines of the file.

---

# List Contents of Directories

## Utilities Two Menu

### Usage:

`ls [-adhlov] [d:][path] filename.ext`

### Options:

- no arguments list current directory
- a all files including subdirectories, . (current) , .. (parent), and hidden files.
- b include file size in column output.
- c single column output.
- d sort the files by date.
- e directories only.
- h help.
- l long listing: date, time, and backup information.
- s sort by filename.
- r reverse order of sort.
- t sort by time.
- z sum file sizes.

### Example:

`ls -acs c:\us\bin\*.exe`

Will output all files with extension of 'exe' sorted with one file per line of all the files in the directory \us\bin on the drive 'c'.

Note: Sorts fields may be any combination of filename, date, and/or time.

---

# Diagnostics Menu

The utilities provided are as follows:

- itemtd - checks for proper operation of switch settings and memory banks. Calls ATMEM to check the AT and PCMEM to check the PC and XT.
- gio - checks to see if game port is working properly.
- idestd - determines which serial ports are active and which addresses they occupy.
- ideptd - determines which parallel ports are active and which addresses they occupy.

To execute a program, press the function key corresponding to the name of the program and then enter any arguments (such as options or filenames) and press <RETURN>. The program will execute and will then wait for any key pressed to return to the Diagnostics Menu.

---

# Memory Test

## Diagnostics Menu

If you have system types PC, XT, or Portable:

This diagnostic function tests installed memory. The system memory is determined and displayed as a map of 64k banks of memory. The memory map may not reflect the total memory installed due to improper switch settings and/or defective memory chips. Any unused memory banks will be displayed as "X", functional memory banks will be displayed as "G".

All of available memory may be tested or a specific range may be tested by entering a starting bank address and range (number of banks times 64). A nonfunctional bit will be displayed in the memory map as a blinking "B". Consult the user documentation for additional information.

If you have system type AT:

ATMEM is a totally new diagnostic written to be used on an AT only. This program is capable of testing up to 16 megabytes of memory. Because this program uses a 64k buffer to allow for writing and reading such a vast amount of memory, it is necessary that, if run from the command line, there be at least 128k of known good memory in the system. If this program were run from IDEAMENU then at least 256k of known good memory is needed. (If this program were run from the lowest possible location in memory the "128k/256k known good memory" would be memory that was purchased with the AT and would be the responsibility of the user and/or IBM).

---

Once selected to execute, the ATMEM program will read the amount of memory indicated in CMOS on your AT and output this information to the display (CMOS information becomes resident after running IBM's Advanced Diagnostic "setup" on your AT).

Also displayed at this time is a "memory map of availability", this map is created as the program "scans" through memory and finds functional memory blocks. The map will show the location of functional 128k blocks within each megabyte of memory by displaying a "G", non functional or nonexistent memory will be displayed as an "X"

If the map shows X's between blocks that are marked as G's, a warning message "warning: non contiguous memory" will be displayed. The warning message is there because you MAY have set the start address of the extended memory on your IDEAcad at the wrong address, thereby creating a "gap" in the sequencing of memory blocks. The warning message could also appear because the memory blocks marked X between the G's is non functional or bad. If the switches on your IDEAcad check out okay, then continue the test using the "R" (range) feature which will be explained below.

At the bottom of the display will be a question, "Do you want to test a range (R) of memory, or exit (any other key)?" Selecting "R" for range will prompt user for additional input in reference to the "memory map of availability". User is asked to enter a starting row and column, and an ending row and column. Row # should equal, within which megabyte, this is indicated on the map as the left most vertical line of numbers 0 - 15 labeled "MEGS". Column # should equal, which 128k block within the megabyte, this is indicated on the map as the top horizontal line of numbers 0 - 7 labeled "128K BLOCKS WITHIN MEG"

---

Once "R" is selected and user inputs valid data the display will change to a new "page", here you will see the real address of the 128k blocks being tested as well as the 16 data bits and 2 parity bits (D0 - D7P) (D8 - D15P). Normally under each data bit and parity bit a 'G' will be displayed, but, if during testing of a block, a data error or address error occurs, the bit or bits associated with the bogus data will be shown as a blinking 'B' under the associated data bit. This shows that that chip or those chips are defective. Note that while a data error occurs, the parity bits will also blink 'B', this shows normal parity operation since data read is not equal to data written. If there are NO data bits shown as blinking 'B', and the parity bit IS blinking 'B', then that chip or those chips have a parity problem and are defective.

As each line is displayed 21 tests are performed on each 128k block. If a data or parity error occurs use the "memory address in kilobytes" column data and the table in this manual to help you identify the chip or chips that are defective on you IDEAcad. If you would like to stop the display you can use the CTRL NUM LOCK feature or if you would like to exit the program before normal completion the CTRL BREAK feature is also available.



---

# Serial Test

## Diagnostics Menu

Usage: idestd

This diagnostic determines which serial ports are active and which addresses they occupy.

---

# Parallel Test

## Diagnostics Menu

Usage: ideptd

This diagnostic determines which parallel ports are active and which addresses they occupy. The printer ports can be tested by connecting a printer and selecting the desired port. If the parallel port is functioning properly the video output will exactly match the printer output.

If only 1 parallel port is installed, DOS print commands will recognize this as LPT1 regardless of what address the port is configured as.

---

# Game Port Test

## Diagnostics Menu

Usage: gio

This diagnostic function tests the game control adapter option. It may test up to 2 joysticks and 4 push buttons which may be interfaced to the connector. Only 1 joystick and 2 buttons may be tested at a time. To alternate between joysticks, the user must press the space bar. The X, Y movements of the joystick are checked by filling in the grid box. It is not necessary to fill in all the dots in the box, since the area covered is dependent upon the individual joystick. The area covered should be somewhat rectangular in shape.



---

# Appendix B:

## Installing IDEAmix and 32Kb Option Board Memory

---

If the total system memory (before adding the IDEAmix optional memory) is not divisible by 64K bytes, you have 32K byte memory option board(s) installed in your system.

The starting address of the IDEA optional memory must be a multiple of 64K bytes. We recommend that you install the IDEA memory to begin where the system memory ends, and set your 32K option board memory to begin where the IDEAmix memory ends.

Set your switches as follows:

- Starting address on IDEAmix switch bank 1 to:  
$$\begin{array}{r} \text{Total system memory (without optional IDEA memory)} \\ - 32 \\ \hline \text{Starting address of IDEAmix memory} \end{array}$$
- Starting address of 32K option board memory:  
$$\begin{array}{r} \text{IDEAmix starting address} \\ + \text{Amount of IDEA optional memory} \\ \hline \text{Starting address of 32K option board memory} \end{array}$$
- New total amount of system board memory (IBM switch bank 2):  
$$\begin{array}{r} \text{Starting address of 32K option board memory} \\ + \text{Total amount of system board memory} \\ \hline \text{New total amount of system board memory} \end{array}$$



---

# Appendix C:

## Upper Range Option Memory Addressing

---

The switch settings for starting addresses above 256K on your IDEAmx board do not use all the 64K memory blocks. See Figure 209, Starting Memory Addresses for switch bank 1.

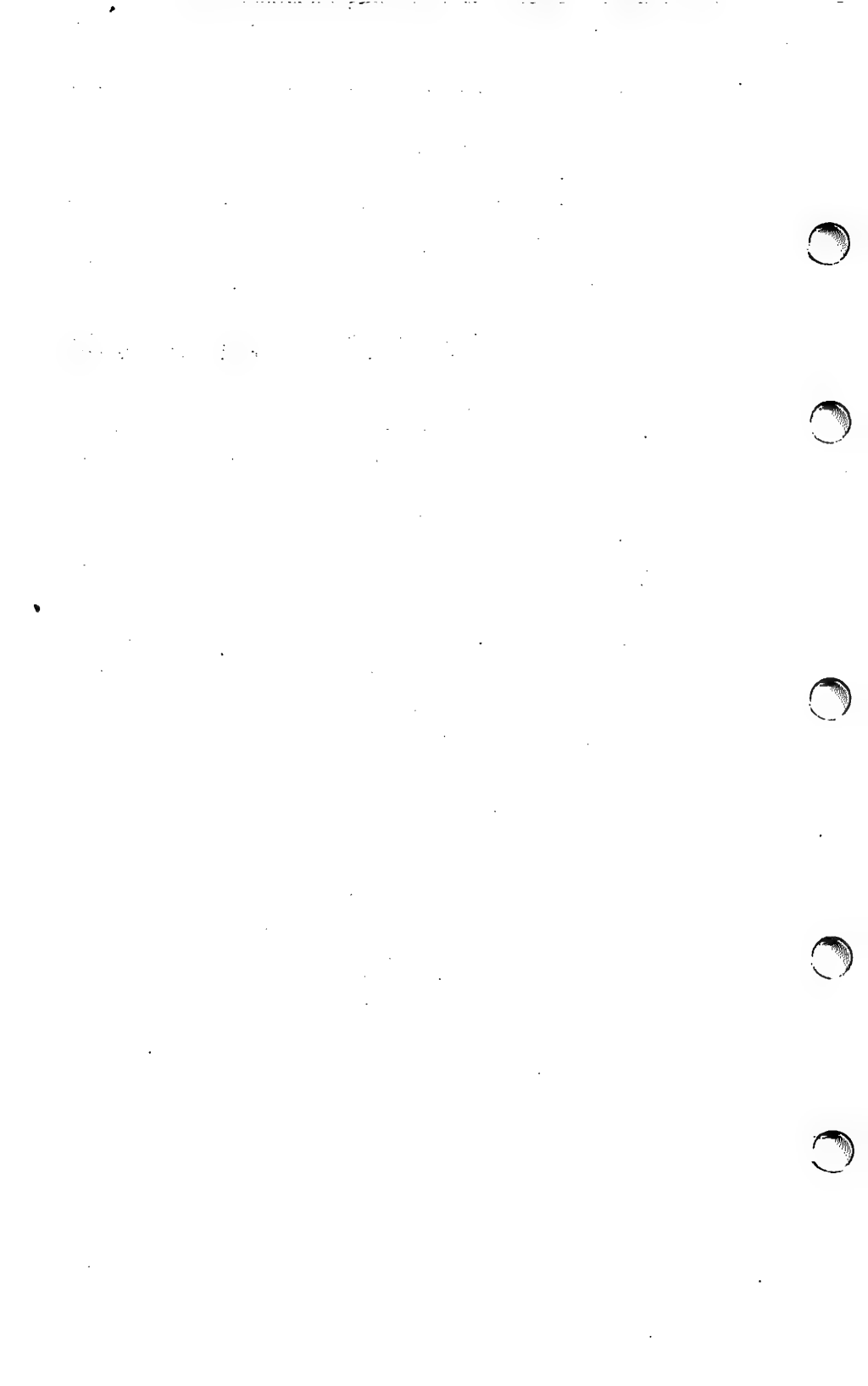
Memory use is as follows:

Starting Address on IDEA Board	Starting Address					
	1st 64K Block	2nd 64K Block	3rd 64K Block	4th 64K Block	5th 64K Block	6th 64K Block
320K	320K	384K	448K	512K	576K	NF
384K	384K	448K	512K	576K	NF	NF
448K	448K	512K	576K	NF	NF	NF
512K	512K	576K	NF	NF	NF	NF

NF: No Function

Figure C-1: Switch Settings for Upper Memory


This procedure restricts the addressing of the IDEAmx card to the IBM defined user area. It prevents the IDEAmx card from interfering with the IBM XT disk software or IBM Display Memory.





---

# Appendix D: Optional Switch Settings (for Advanced Users)



The recommended switch settings are given in Section II under "Setting Switches." Alternate settings are listed here.

The Hex address gives the starting offset address for the serial and parallel ports. The "A"s in the binary address equivalent indicate the bits that control access to registers in the port. The "X"s designate masked bits. References to the various registers can be found in the appropriate IBM *Technical Reference*. The sections for each port are listed below. The I/O address map for the IBM PC is under "Hardware," in the IBM *Technical Reference*. For the AT, it is in Section I of the *Technical Reference*.

(See Address diagrams on the following pages.)

# IDEA Switch Bank 2

Interface Addresses		Logical Addresses		Switch Bank 2 Setting
Port Name	Hex	Binary		
		MSB	LSB	
<sup>1</sup> Serial Port 1	3F8-3FF	0011 1111	1A <sub>2</sub> A <sub>1</sub> A <sub>0</sub>	
<sup>1</sup> Serial Port 2	2F8-2FF	0010 1111	1A <sub>2</sub> A <sub>1</sub> A <sub>0</sub>	
<sup>2</sup> Serial Port 3	218-21F	0010 0001	1A <sub>2</sub> A <sub>1</sub> A <sub>0</sub>	
<sup>3</sup> Parallel Port 1	378-37F	0011 0111	1XA <sub>1</sub> A <sub>0</sub>	
<sup>3</sup> Parallel Port 2	278-27F	0010 0111	1XA <sub>1</sub> A <sub>0</sub>	
<sup>4</sup> Real Time Clock	2C0-2DF	0010 110A	A <sub>3</sub> A <sub>2</sub> A <sub>1</sub> A <sub>0</sub>	
Game Port	200-20F	0010 0000	A <sub>3</sub> A <sub>2</sub> A <sub>1</sub> A <sub>0</sub>	

Figure D-1: Optional Settings for Switch Bank 2.

---

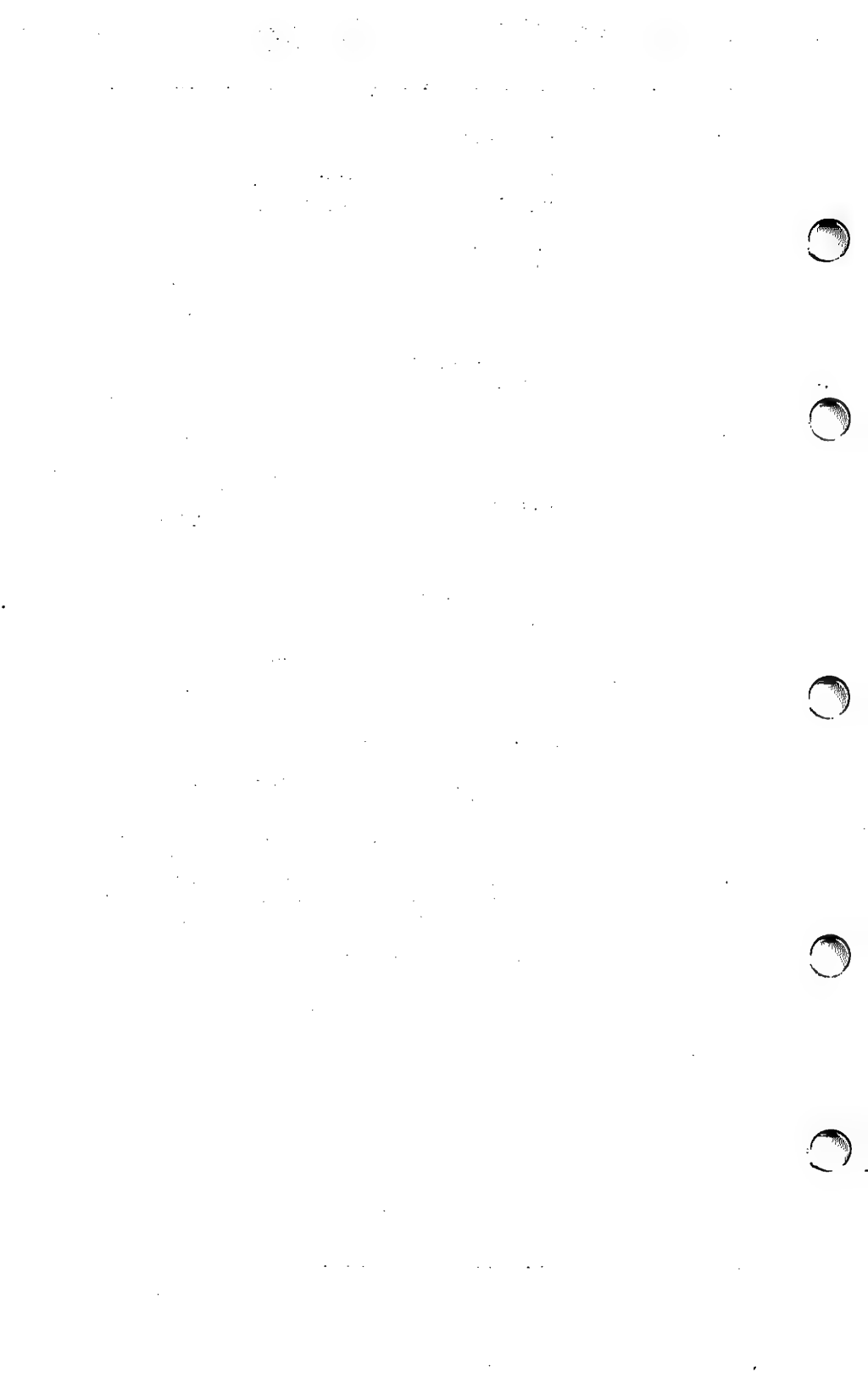
## Interrupt Lines

Port Name	Bus Selected Interrupt Lines	Jumpers
<sup>1</sup> Serial Interrupt for COM1	IRQ4	IN———W3
		OUT———W2
		OUT———W1
<sup>1</sup> Serial Interrupt for COM2	IRQ3	OUT———W3
		IN———W2
		OUT———W1
<sup>2</sup> Serial Interrupt for COM3	IRQ2	OUT———W3
		OUT———W2
		IN———W1
<sup>1</sup> Parallel Primary Interrupt	IRQ7	

Figure D-2: Interrupt Lines

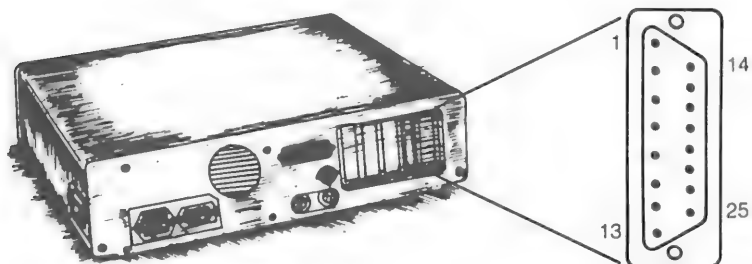
### Footnotes

1. Please refer to the *IBM PC Technical Reference*, pages 2-123 to 2-147 for register control.
2. Please refer to Appendix G for register control information.
3. Please refer to the *IBM Technical Reference*, pages 2-65 to 2-70 for register control. For the AT, refer to pages 1-12 through 1-58 of the *IBM Technical Reference* for the AT.
4. Please refer to Appendix F for register control information.



# Appendix E: Interface Connector Specifications

## Parallel Printer Port



AT STANDARD TTL LEVELS

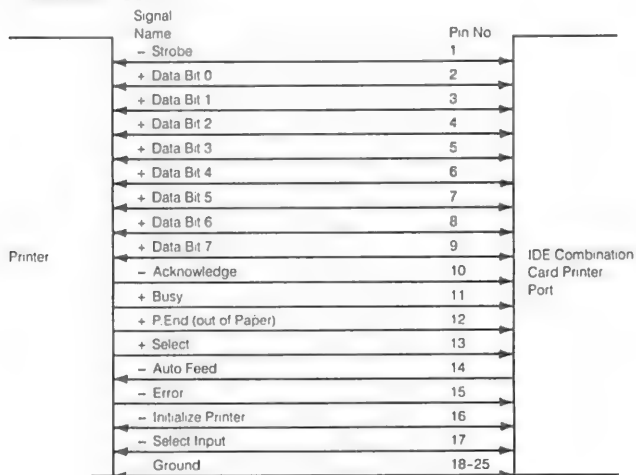
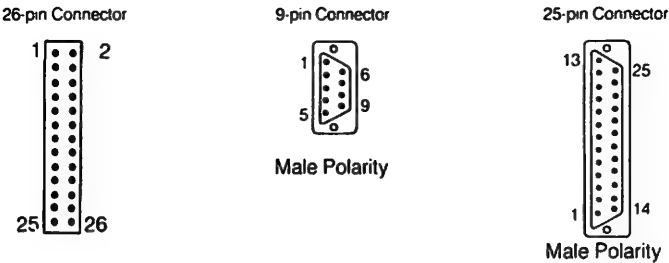


Figure E-1: Parallel Port Pins

# Serial Port



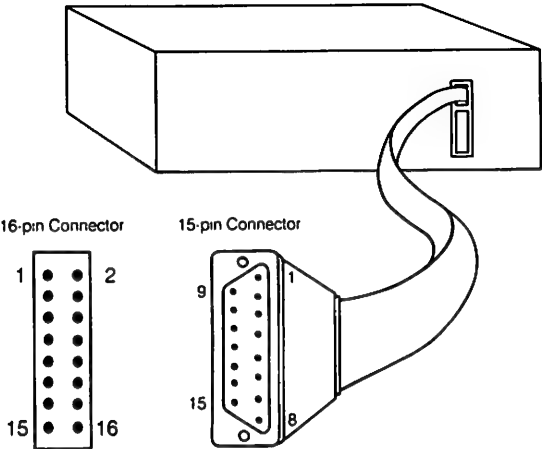
At Standard Levels			
	26 pin	9 pin	25 pin
Description			
Ground	1		
NC			1
Transmit data	3	1	2
Receive data	5	6	3
Request to send	7	2	4
Clear to send	9	7	5
Data set ready	11	3	6
Signal ground	13	8	7
Carrier detect	15	9	8
NC	17		9
NC	19		10
NC	21		11
NC	23		12
NC	25		13
NC	2		14
NC	4		15
NC	6		16
NC	8		17
NC	10		18
NC	12		19
Data terminal ready	14	4	20
NC	16		21
Ring indicate	18	5	22
NC	20		23
NC	22		24
NC	24		25
NC	26		

Figure E-2: Serial Port Pins

**Note:** To avoid inducing voltage surges on interchange circuits, signals from interchange circuits shall not be used to drive inductive devices, such as relay coils.

NC: No Connection

# Game Port Adapter

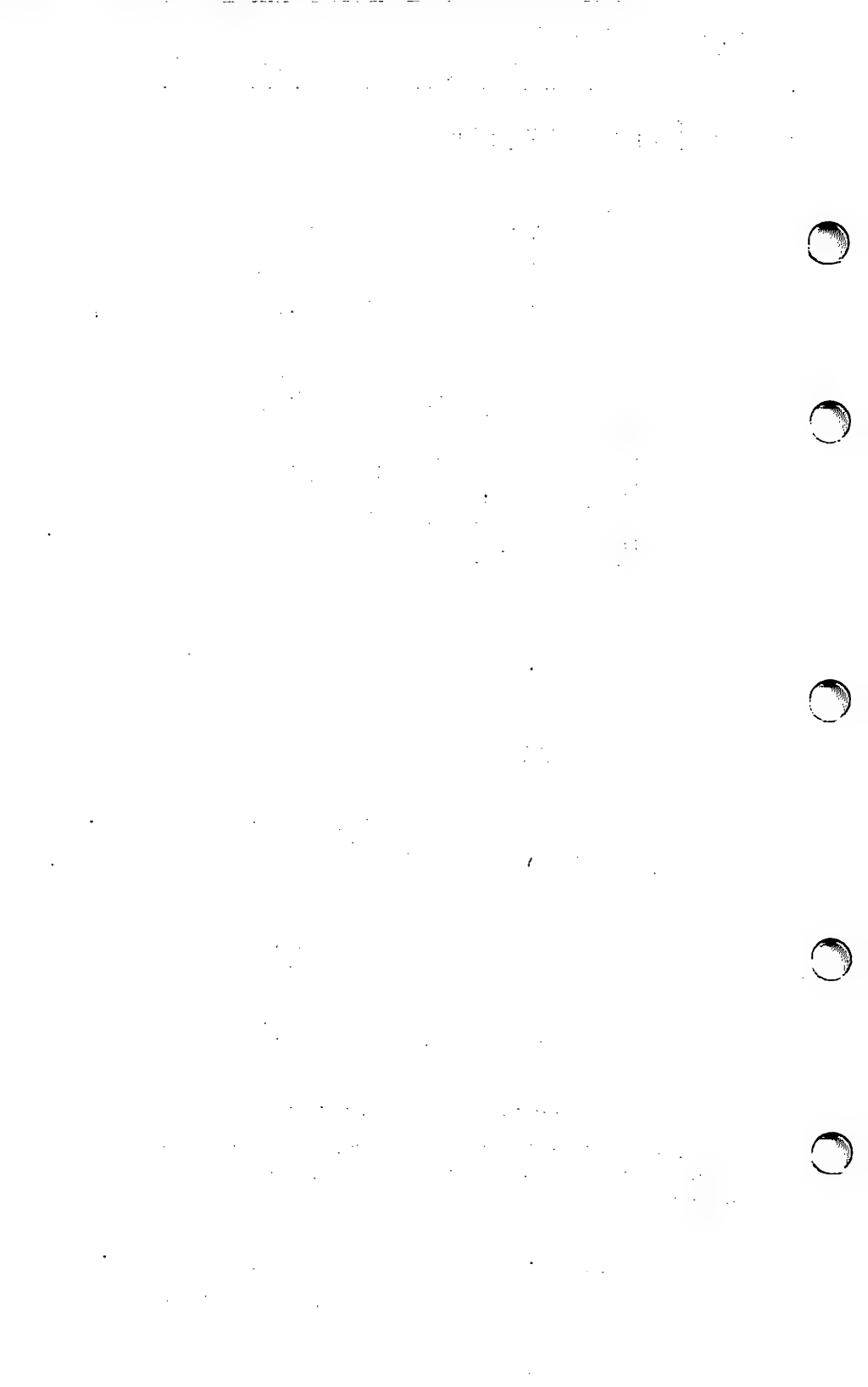


	15-pin	16-pin	
	1	1	
+ 5	2	3	
Data 0 Read	3	5	→
Data 0 Fire	4	7	←
Ground	5	9	
Data 1 Fire	6	11	→
Data 1 Read	7	13	←
+ 5	8	15	→
+ 5	9	2	
Data 2 Read	10	4	→
Data 2 Fire	11	6	←
Ground	12	8	
Data 3 Fire	13	10	→
Data 3 Read	14	12	←
+ 5	15	14	→
NC		16	

**Figure E-3: Game Port Pins**

**Note:** To avoid inducing voltage surges on interchange circuits, signals from interchange circuits shall not be used to drive inductive devices, such as relay coils.

NC: No Connection





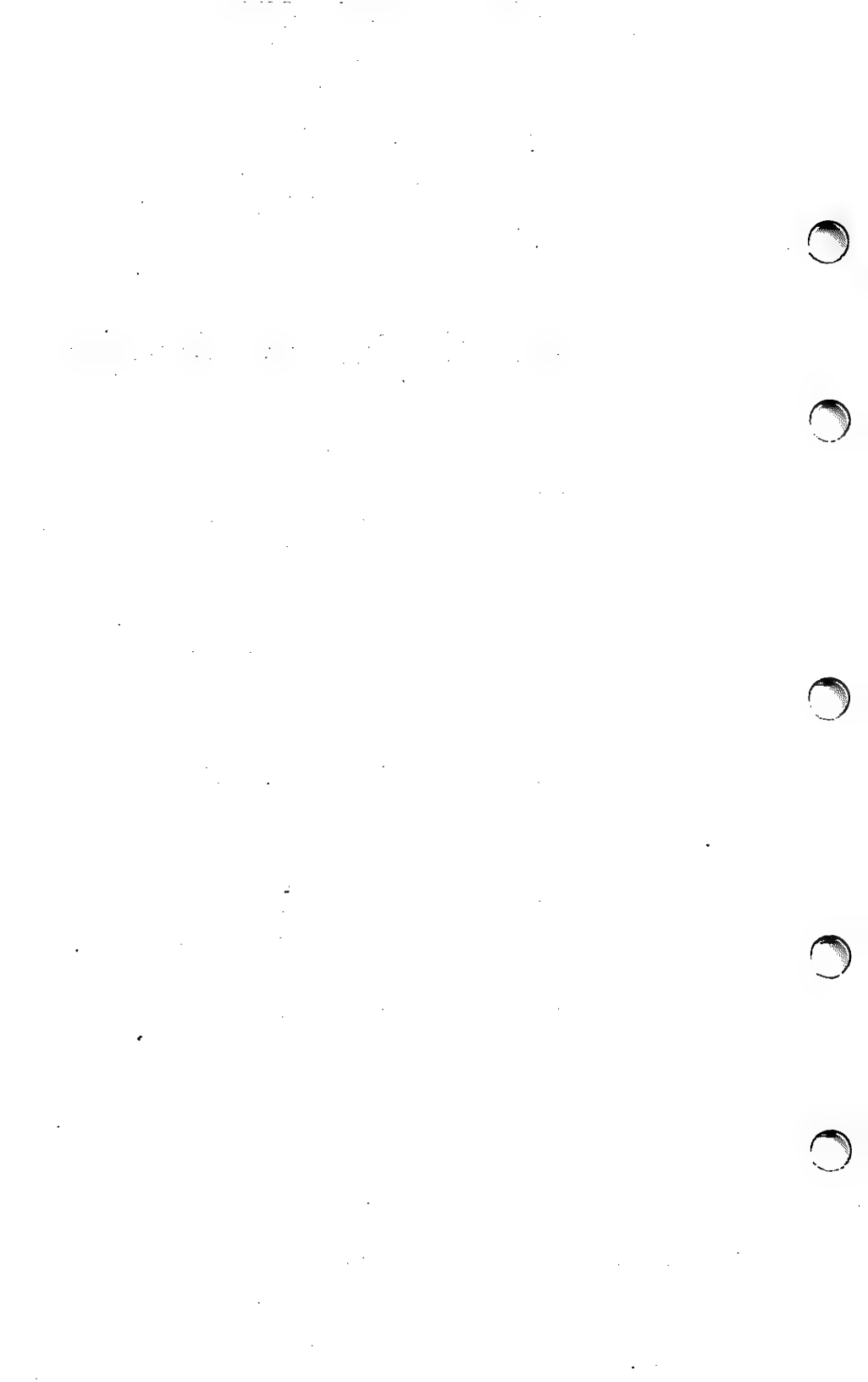
# Appendix F: Time of Day Clock Address

This appendix is not needed for users of the AT.

Address Codes and Functions

A9	A8	A7	A6	A5	A4	A3	A2	A1	A0	Function
1	0	1	1	0	0	0	0	0	0	Counter—Ten Thousandths of Seconds
1	0	1	1	0	0	0	0	0	1	Counter—Hundredths/Tenths of Seconds
1	0	1	1	0	0	0	0	1	0	Counter—Seconds
1	0	1	1	0	0	0	0	1	1	Counter—Minutes
1	0	1	1	0	0	0	1	0	0	Counter—Hours
1	0	1	1	0	0	0	1	0	1	Counter—Day of Week
1	0	1	1	0	0	0	1	1	0	Counter—Day of Month
1	0	1	1	0	0	0	1	1	1	Counter—Month
1	0	1	1	0	0	1	0	0	0	RAM
1	0	1	1	0	0	1	0	0	1	RAM
1	0	1	1	0	0	1	0	1	0	Six Month Flag
1	0	1	1	0	0	1	0	1	1	Year—Low
1	0	1	1	0	0	1	1	0	0	Year—Centuries
1	0	1	1	0	0	1	1	0	1	RAM
1	0	1	1	0	0	1	1	1	0	RAM
1	0	1	1	0	0	1	1	1	1	RAM
1	0	1	1	0	1	0	0	0	0	Interrupt Status Register
1	0	1	1	0	1	0	0	0	1	Interrupt Control Register
1	0	1	1	0	1	0	0	1	0	Counters Reset
1	0	1	1	0	1	0	0	1	1	RAM Reset
1	0	1	1	0	1	0	1	0	0	Status Bit
1	0	1	1	0	1	0	1	0	1	GO Command
1	0	1	1	0	1	0	1	1	0	Standby Interrupt
1	0	1	1	0	1	1	1	1	1	Test Mode


Figure F-1: Address Codes for Clock



---

# Appendix G:

## Serial Port COM3



IDEAssociates has supplied an address and interrupt combination to allow you to define COM3.

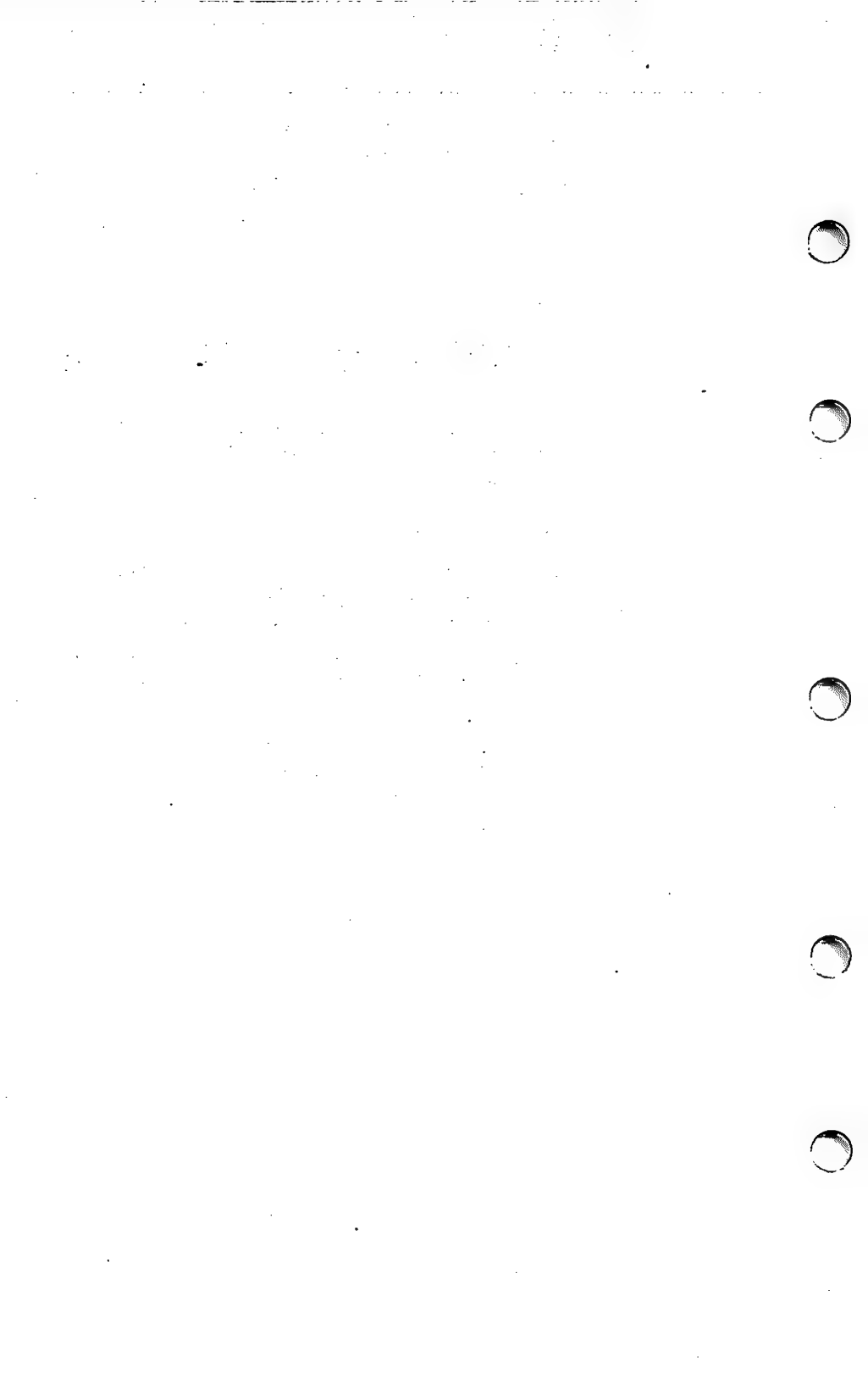
The address is 218-21F Hex.

The interrupt is IRQ2.

Since these are not standard IBM locations, standard IBM software will not find the COM3 port. However, you may be able to use the port for your own purposes.

The register offsets for COM3 are the same as those for COM1 and COM2, except that the base address is 218 Hex.

Make sure that your use of COM3 does not conflict with the operations of other hardware in the system (e.g., interrupt IRQ2 is used by IDEAnet).



---

# Appendix H: Technical Specifications

The IDEAmix Combination Card is designed to operate with the IBM PC, PC-2, XT, and AT without hardware modifications.

## Power Requirements

+ 5 Vdc 1.2A Typical (Fully Configured)

+ 12 Vdc 34mA

– 12 Vdc 34mA Serial Port Only

## Temperature

Operating 50°F to 112°F (10°C to 44°C)

Non-operating – 40°F to 140°F (– 40°C to 60°C)

## Dimensions (envelope)

Length 13.81 inches (350.8 mm)

Width 5.00 inches (127.0 mm)

Thickness 1.13 inches (28.7 mm)

Weight 0.5 lbs (90.9 gm)

Shipping Wt. 1.5 lbs (681.8 gm)

## Serial (RS232C) Port

Connector 25 D subminiature shell male. Meets EIA Standard RS232C.

## Parallel Printer Port

Connector 25 D subminiature shell female.

---

## **Electrical Specifications**

Pin 2 through Pin 9 Source 5 mA. Sink 32 mA.

Pins 1, 14, 16, 17 driven by open collector drives pulled to +5V through 4-7K ohm resistors. Sink 30 mA.

Pins 10,11, 12, 13, 15 High level input sink 0.1 mA. Low level output source 0.4 mA.

Pins 18 through 25 ground.

## **Clock/Calendar/Battery**

Panasonic BR2535 battery, one year life.

---

# Appendix I:

## Glossary



### **Asynchronous communications.**

Method of communications where data is sent as soon as it is ready.

### **Asynchronous communications interface adapter.**

A device providing the data formatting and control necessary to permit asynchronous communications with a microcomputer.

### **ASCII.**

American Standard Code for Information Interchange. A coding scheme wherein letters, numbers and special symbols are represented as unique seven-bit values, allowing for standardization between data communications devices.

### **Back-up.**

A duplicate copy of data.

### **Baud.**

Unit related to bits per second, used to measure the rate at which information moves between computers.

### **Bit.**

Abbreviation for "binary digit." A bit is the smallest unit of information recognized by a computer, expressed as the digits 1 or 0.

### **Bits per second (bps).**

The instantaneous bit speed with which a device or channel transmits a character.

### **Boot.**

Refers to bringing up the operating system.

### **Buffer.**

Temporary storage, for characters that need to be collected prior to processing.

---

**Bus.**

Any path over which electrical impulses travel.

**Cable.**

A group of wires connecting two or more pieces of equipment.

**Channel.**

A path along which signals or information can be sent.

**Character.**

An alphanumeric symbol.

**Data rate.**

The speed at which data is sent to a receiving computer or device, measured in bits per second.

**Disk controller.**

A hardware device that controls a physical disk drive.

**Disk operating system (DOS).**

The operating system for the IBM PC/XT.

**Drive data cable.**

A cable for transmitting data between the PC and the disk controller.

**Drive power connector.**

The components for connecting power to the disk drive.

**EBCDIC.**

Extended Binary Coded Decimal Information Code. A coding scheme wherein letters, numbers and special symbols are represented as unique six-bit values, allowing for standardization between data communications devices; popularized by IBM.

**Echo.**

Displaying information sent or received on the terminal, to visually detect transmission errors. Remote echo comes from the host computer. Local echo comes from your transmission.

**Formatted disk.**

A disk that has been initialized with DOS.

**Full-duplex.**

Communication channel capable of transmitting and receiving data simultaneously.



---

**Game port.**

Interface on an adapter card used to connect a game peripheral and the computer.

**Half-duplex.**

Communication channel capable of handling transmissions in one direction at a time.

**Host adapter.**

A hardware device which serves as a link between the IBM PC and the disk controller.

**Host computer.**

Primary or controlling computer in a multiple computer system upon which the smaller computers depend to allocate the resources of the system.

**Interrupt.**

A processor feature that allows the currently executing program to be deferred in favor of servicing another.

**Kb.**

Abbreviation for kilobyte. 1,024 bytes (characters) of information.

**Logical drive.**

A logical portion of a physical disk drive.

**Off-line.**

Communications devices not physically connected to or using a communications medium.

**On-line.**

Communications devices physically connected to and using a communications medium.

**Option memory.**

RAM memory located on option boards.

**Parallel transmission.**

Simultaneous transmission of all bits in a byte.

---

**Parallel port.**

Interface located on an host adapter card used to connect a disk drive or printer to the PC.

**Parity.**

The integrity of each character transmitted over a communications link can be tested by generation and subsequent checking of character parity. Parity is computed using the bit-wise "or" of the character bits and adding an extra bit to cause the result to be even or odd.

**Partition.**

A portion of a hard disk with a size expressed in the disk sectors.

**Peripheral.**

A noncomputing input or output device, such as a printer or hard disk drive.

**Queue.**

A waiting line used to organize tasks when there is a delay in service.

**RAM.**

Random access memory. Items in RAM can be randomly retrieved and augmented. Each byte can be accessed regardless of its location. Information is eradicated when the computer is turned off.

**Read/Write Head.**

The component of a disk drive which senses the signals recorded on the magnetic media.

**Real time.**

Pertaining to the actual time during which a physical process transpires.

**Reboot.**

Refers to bringing-up the operating system in the middle of a session. This is accomplished by pressing the Ctrl, Alt and Del keys simultaneously.

**Remote drive.**

Disk drive located at a distance from your PC workstation.

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**RS232C.**

The interface between data terminals and data communications devices using serial data transfer is, to some degree, defined by this standard.

**RS232C cable.**

Standard communications connect cable, similar to cable used to connect a television to an antenna.

**Serial port.**

Common serial communications interface used by modems and printers.

**Serial transmission.**

Communications method where data is sent in a regular pattern of bits.

**Server PC.**

Microcomputer used by network as source of disk drives and information.

**Shell D connector.**

Plug shaped like the letter "D".

**Spooling.**

Simultaneous Peripheral Operations On-Line. Process of allowing programs using slow output devices to complete execution rapidly. Data is temporarily stored in buffers or queues for later low-speed transmission concurrent with normal system operation.

**Synchronous communications.**

Communication method where speed and flow of information being transmitted is controlled by equally spaced clock signals or pulses.

**System memory.**

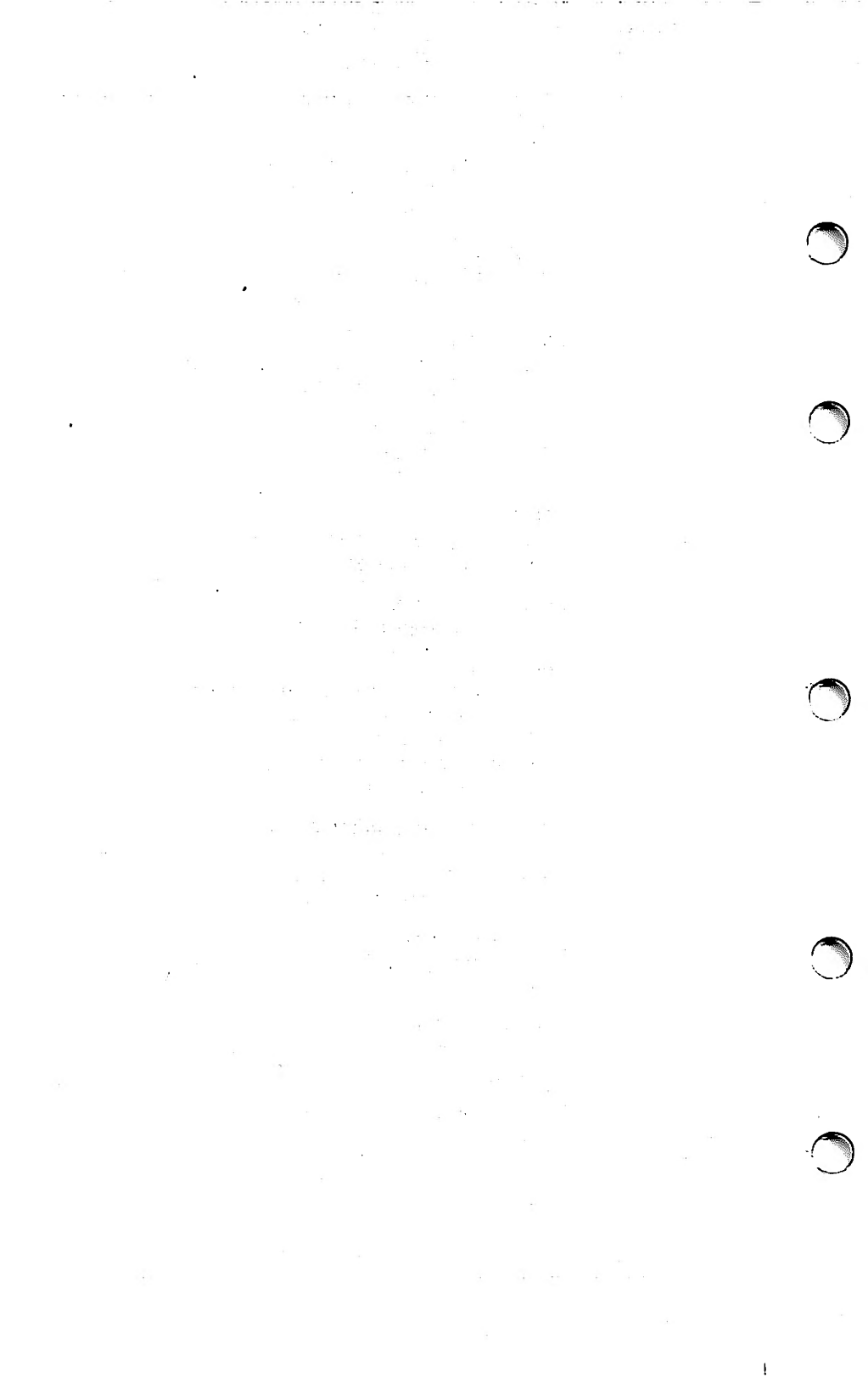
The amount of RAM installed on the IBM PC system board.

**Terminal Mode.**

Condition of your PC when it is connected to a host computer.

**Transfer rate.**

See Data rate.



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# **Appendix J: Customer Support Information**



## **IDEAmax Combination Card Upgrade**

When you order an upgrade from IDEAssociates, we will send you a new IDEAmax Combination Card with the additional memory or options. After receiving your new board, you must return the original to us in the proper shipping container. You will maintain your initial warranty and receive a one year warranty on the additional memory and options.

Upgrades can be ordered in 64K byte, 128K byte and 192K byte segments. Real time clock, serial (RS232C) port, and parallel printer port can also be added.

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# Repair Policy

If you are still under the original one year warranty, IDEAssociates will replace your board at no charge to you. If you are out of your warranty period, we will repair the board and charge you on a time and materials basis. To return your IDEAmix Combination Card, you must take the following steps:

1. Contact your dealer about the problem first.
2. If your dealer is not able to provide a resolution, then call IDEAssociates' toll-free number: 800-257-5027.
3. If your card needs replacement or repair, IDEAssociates' Technical Support group must issue a Materials Return Authorization (MRA) number for you to use.
4. Box your IDEAmix in the original shipping container or other secure package. Write your return number on the top of the box.
5. Ship by the most economical means available to:

IDEAssociates, Inc.  
35 Dunham Road  
Billerica, MA 01821

## Warranty Card

Please fill in the enclosed warranty card and return it promptly. Remember to record the serial number of your board both on the return card and in your manual.